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Avertin Narcosis in the Small Domestic Animals.*

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The value of colonic narcosis has long been recognised in veterinary practice, and attempts have been made to use the older methods in a manner similar to that adopted in man. We have used the rectal ether method of Gwathmey, but have not obtained good results. In America, Beckman[5] has recorded success in dogs from the introduction into the colon of a 75-25 olive oil-ether mixture, after having narcotized the animal by the subcutaneous injection of comparatively large doses of morphine (0·019 grm. per kg. or 1½ gr. per 20 lb.). Our experience of this method has not been satisfactory. Later we adopted the preparation used in the human subject by Basil Hughes[3], and with this we were able to produce anæsthesia. The results were too uncertain for the method to be of any practical value. The onset of narcosis was too slow and the animal usually ejected the liquid before narcosis was attained. It was also attended by excitement.

We greatly needed a safe and reliable narcotic for the cat, and lately have been using avertin anæsthesia. This animal is particularly resistant to the action of most of the recognised narcotics. Morphine is useless, giving rise to excitation and delirium. Agents such as chloral hydrate, paraldehyde and the barbital group, are most uncertain, and although urethane is used by physiologists, we have no knowledge as to its consistency or safety. Thus, for narcosis in the cat, we had been compelled to use chloroform or ether, or a mixture of these, by inhalation. Inhalation anæsthesia is by no means free from risk, nor is administration a simple procedure. The period of excitement tends to be greatly exaggerated, particularly as the animal fears—and resists vigorously—compulsion to inhale a strange and pungent vapour. One of the most striking features of avertin narcosis is absence of violent struggling during induction.

These notes on the use of avertin in animals are the result of our experience in 110 cases: 70 in the cat, 37 in the dog, and 3 in the horse, the animals having been presented for treatment at the Poor Out-patients' Department at the Royal Veterinary College. They comprise animals of all ages and sizes.

The Cat.—I will deal firstly with the cat. It is with this animal that we have done most work. It is the species in which a rectal narcotic is most indicated, and it is also the one in which we have obtained the most consistent results from avertin. Our first concern was dosage. It had already been established that for man a safe and effective dose was 0·1 grm. per kg. body weight[1,2], and with this we commenced. It produced, however, only slight narcosis, and so we increased until we arrived at the conclusion that for comparatively healthy cats a dosage of 0·3 grm. per kg. provoked narcosis which in 60 per cent. of cases amounted to general anæsthesia and in the remaining 40 per cent. produced a narcosis far more profound than any other narcotic at our disposal, but one in which sensation was not completely lost. In these cases, we have found the induction of complete anæsthesia by inhalation to be a simple and safe procedure. The method of computing the dose by body weight is the best at our disposal, but we hasten to add that disease, age, etc., must be taken into consideration. Young animals are considerably less susceptible than adults, and the 40 per cent. mentioned previously practically all occurred in animals under nine months old.

It may be of interest to mention here what these doses actually are. The average adult cat weighs from 8 to 12 lb. (3·7 to 5·4 kg.) and the dose of avertin is from 1 to 1·5 c.c. The smallest dose we have used is 0·35 c.c. (6 minims) for animal weighing 2¾ lb. and the largest 2 c.c. for one weighing 15 lb. The total amount of the injection varies from 12 to 60 c.c. (½ to 2½ oz.).

Of the cats dealt with we have had three deaths attributable to avertin.

The injection is prepared in the manner recommended by the makers and the technique of administration will be demonstrated to you.* We do not prepare the subject in any way. It must be borne in mind that when dealing with animals of a highly nervous nature, such as the cat, the less interference and restraint used, the better the results.

Although the congo red test for acidity is said to be obligatory, we have never found avertin break down during preparation. In three per cent. solution it is entirely without irritant effect upon the rectal mucosa and never produces straining. It is rapidly absorbed, and evidence of muscular relaxation occurs from two to three minutes after injection, whilst the onset of narcosis generally occurs in from five to eight minutes. It is usually preceded by a slight phase of involuntary excitement, indicated by a few tetanic spasms of the limbs and back. In exceptional cases the onset of narcosis is extremely rapid and entirely without evidence of excitement; in fact, we have had cases in which general anæsthesia was present 45 seconds after the completion of the injection.

I have previously referred to the fact that once absorption has occurred, all evidence of struggling is lost; in fact, throughout, the sensation appears to be a delightful one. Quite frequently one finds an animal purring away in a condition resembling natural sleep. Narcosis reaches its

* Presented to the Section of Comparative Medicine of the Royal Society of Medicine, October 22nd, 1930. Reproduced from the *Proceedings of the Royal Society of Medicine*, December, 1930. Vol. xxiv. No. 2.

* A demonstration followed the reading of the paper.

maximum depth in about fifteen minutes and persists thus for from one to two hours. This is followed by a period of sleep for some twelve hours and locomotor inco-ordination is often still present after twenty-four hours. Recovery is not accompanied by any sickness or nausea, in fact food is quickly taken.

In safe anæsthesia, respirations become slower and shallower, but remain regular, usually from twenty to thirty to the minute. The pulse is accelerated and may be 200 or more. A noticeable action upon the circulatory system is a marked dilatation of the peripheral tissues. The skin becomes suffused with blood and a marked warmth of the ears and extremities is felt. The tip of the nose (if unpigmented) and the gums become bright pink. To avoid loss of heat by radiation we make a practice of keeping the animal warm. The action upon the pupil is worthy of mention. In light anæsthesia, when light and corneal reflexes are present, there appears to be little or no effect upon the pupil, but in profound anæsthesia and when reflexes are lost, the pupil contracts and becomes a mere slit. This is considered by some to be evidence of toxicity.

The Dog.—The action of avertin in this animal presents some striking differences. Firstly, the dose necessary to produce narcosis is considerably greater, varying from 0·4 to 0·6 c.c. per kg. body weight. In large dogs the actual dosage necessary is greater than that required for man. We have given as much as 10 c.c. Secondly, the narcosis produced is by no means constant, varying from a transient stupor to a profound general anæsthesia. Thirdly, the duration of effect is always short, as compared with that in the cat. The same dose given to similar animals under similar conditions will in some cases give rise to general anæsthesia which may last for several hours, whilst in others its effect may only last for twenty minutes or even less. Fourthly, the therapeutic margin is smaller and a dose capable of producing serviceable narcosis may cause respiratory failure. Finally, recovery from the effects of the drug is extremely rapid. There is never a period of hours during which the animal is in a condition of sleep. General anæsthesia is followed in the course of fifteen to thirty minutes by complete recovery.

As to toxicity, it has been previously mentioned that, whilst the best method of computing the dose is by body weight, it is far from foolproof. Allowance must be made for age, disease, infirmity, etc., and this can only come as the result of experience with the drug. Any agent having such a profound effect upon the central nervous system must be associated with danger.

Clinical experience has taught us that old age, chronic suppuration and chronic kidney disease are conditions likely to give rise to collapse during avertin narcosis. In this connection it is of interest to notice that C. Bless[4] has shown that reduction in the calcium and natrium content of the blood increases the toxicity of avertin and reduces the quantity necessary to produce narcosis. It has been shown that, as with other poisons, the protective rôle of the liver is proportional to its glycogen content, so that with fasting animals the dose must be reduced.

I will not attempt to deal with the fate of avertin. It is held that the kidneys are the chief means of excretion, but that excretion is slow and that cumulation may occur if a second dosage is given too soon[6]. Our experience is that whilst this is true in the case of the cat, it is not so in the dog. In this animal we find that excretion is rapid. We have given a four-months-old puppy a 0·4 grm. dosage, which gave rise to a transient narcosis. In one hour's time this was followed by a 0·5 grm. dose and again only transient narcosis occurred. A 0·9 grm. dosage given at one time would probably have proved fatal.

In cases of poisoning collapse occurs early, usually from 5 to 10 minutes after injection. There is a notable change in respirations. A deep inspiratory movement is followed by a quivering of the abdominal muscles, after which all respiratory movement may cease. Sometimes the Cheyne-Stokes type of respiration is observed. The heart always continues to beat for from two to ten minutes after respiratory movements cease. Prompt antidotal treatment should immediately be given.

A case will serve to illustrate this:—

Three-years-old male Pekingese dog, suffering from a necrotic neoplasm the size of an egg, involving upper lip and gums. Weight 4 kg. (9 lb.), dosage 0·4 grm. = 1·6 c.c. In one minute general anæsthesia. At 1½ minutes respirations ceased. Heart beating slowly and irregularly. Adrenalin 0·5 c.c. given intraperitoneally. Artificial respiration commenced. Normal saline 15 c.c., subcutaneously 50 c.c. per rectum. Fifteen minutes: breathing recommenced. Thirty minutes: sensation returning. One hour: complete consciousness. Twenty-four hours: normal as regards avertin.

We have had, in animals, six deaths definitely attributable to avertin, three in the cat and three in the dog. In four there was extensive suppuration, in one, advanced chronic nephritis. In the sixth animal, a cat, no predisposing cause could be found.

Conclusions.—For the cat, avertin, per rectum, in a dosage of 0·3 grm. per kg. body weight is, in healthy animals, a consistent and safe narcotic. In adults this narcosis is usually sufficiently profound to be classed as general anæsthesia. In young animals, however, narcosis alone is the general rule, so that for completion of anæsthesia, a little chloroform or ether by inhalation is necessary.

Administration is easy. The induction of narcosis is not accompanied by any violent struggling, and, although the influence of the drug persists for from twelve to twenty-four hours, it is not associated with any nausea or vomiting.

It will prove a very valuable addition to the agents at our command for provoking narcosis in the cat.

For the dog it is uncertain. The therapeutic margin is small, and thus considerable experience is necessary in computing the dose. Whilst for operations about the head it has considerable advantages over most of the other agents at our disposal, for general surgical work it is inferior to morphine as a narcotic.

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In reply to queries in discussion on the paper, the author said: We have used avertin on three occasions in the horse.

Eleventh International Veterinary Congress, London,

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Abridged Papers.

(*Continued from page 57.*)

Rinderpest (Prophylaxis).

By M. G. Curasson.
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Introduction.

The prophylaxis of rinderpest is a complex question, because many factors intervene to modify the conditions in which it can be practised; the most important is the state of organisation of the country where one operates, because this determines in what condition can be applied the two essential elements of the struggle—immunisation and sanitary measures.

The sanitary measures will vary with the political organisation, the state of evolution of the people, the physical geography and means of communication. Various factors may have influence on the proceedings for immunisation—one must reckon with the psychology of the proprietors of the animals, with the mode of life of the latter, with climate, etc. Reference will be made in the report to modifications of procedure adopted to meet these conditions.

Immunisation.

No value is to be attached to the old processes of attenuation of the virus. The action of heat, abandoned and taken up again by Gordialkowski, ought not to be retained, nor should the method of using as a vaccine the blood of an animal the subject of the disease mixed with 100 c.c. of antipest serum. This was expected to induce a mild attack of rinderpest, instead of which the disease was often found to develop normally, and even if success was sometimes attained the method is dangerous. Attempts have been made by the author and others to immunise against rinderpest by the use of sensitised virus, and although some successes were obtained the results were contradictory and the method was abandoned. Since immunity could not be induced by heating the virus, by attenuating or by sensitizing it, interest is focussed on the recent method of vaccination by the pulp of organs, the virus being killed by various antiseptics.

Vaccination by Pulp of Organs.

The possibilities of this means of vaccination against the disease were first referred to in a communication by the author and M. Delpy to the Central Society of Veterinary Medicine in 1925.

Previously immunisation had been unsuccessfully attempted by virus (blood and peritoneal washings of a diseased animal) treated with various antiseptics. Urged by the works of Vallée, Carré and Rinjard on immunisation against foot-and-mouth disease by formolised virus, the effect of formalin on the virus of rinderpest was explored. Blood and peritonial washings giving inconstant results, the spleen of a diseased animal was used as a source of the virus. Spleen minced and treated with normal saline, to which two to a 1,000 formalin was added, could after 48 hours be used successfully to immunise calves, the dose being the equivalent of five grammes of spleen. Other agents (eucalyptus, toluol, chloroform, etc.), have been employed to modify the virus and its supply has been sought from other organs as well as the spleen—lungs and lymphatic glands.

The author's final procedure for obtaining the vaccine is the following—spleen, lungs and glands are put through a mincing machine and the product is left in contact with normal saline *plus* three to 1,000 formalin for 48 hours, then strained with pressure through gauze, the expressed liquid being the vaccine; it thus results that the veterinarian provided with simple materials can himself make the vaccine and employ it where the disease is rampant and has no occasion, as is the case with other vaccines, to depend on a laboratory. This vaccine has been successfully used in the French and English West African Colonies and in Indo-China.

The experience of several years allows the answer to be given to some questions that arise in connection with this method of producing immunity against rinderpest.

(1) Does the vaccine keep some time and can it be sent a distance? Vaccine four months old has been used in the Soudan with results equal to those recorded for that recently made; however, another experience pointed to the loss of half its power after three months.

Partial immunity is produced eight days after inoculation and it is complete on the 15th day, and protection lasts from eight to 12 months.

(2) Under what conditions should the formolised vaccine be used? Since eight days must elapse before immunity begins to establish itself, there is danger in vaccinating an infected herd by subcutaneous injection; the formolised vaccine should, however, be used on neighbouring healthy herds so as to establish a zone of security. Where the disease is actually occurring, unaffected animals are to receive into the skin 10 c.c. (instead of 40 c.c. subcutaneously) producing local immunity in three or four days, as when the seat of injection is to be scarified and inoculated with virulent blood—an animal thus resists after 12 days a subcutaneous injection of virulent blood. We must

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Expense prohibits its use rectally, and so we have given it intravenously. 10 c.c. given in 300 c.c. of distilled water by the jugular vein caused a 10-cwt. draught mare to fall to the ground anæsthetised in two minutes. Narcosis persisted for eight minutes. Whilst transient anæsthesia of this nature may be serviceable for such operations as castration, for more prolonged anæsthesia chloroform by inhalation will be necessary. In this respect the drug is inferior to chloral hydrate for the horse.

In cases of collapse, the antidotal measures adopted have been the intraperitoneal injection of adrenalin with a view to causing a rapid rise in blood-pressure, and thus serving to stimulate the respiratory centre, and the subcutaneous and rectal injection of normal saline, combined, of course, with continuous artificial respiration. In this connection, in view of the findings of Bless, calcium gluconate might be useful.

Several operators have referred to the variation in the dog, as compared with the cat. It would appear that the dog is capable of breaking down and excreting avertin much more quickly than is the cat.

We do not find the persistence of narcosis for twenty-four hours a disadvantage, in fact in many cases, particularly those of abdominal operations, it is a distinct advantage to have the animal comatose for twenty hours immediately afterwards.

wait for further experience on this subject before recommending its general use.

(3) What method of intervention is most practicable? In West Africa, at any rate, the central laboratory should only produce the vaccine necessary for rapid intervention; use should be made of the animals suffering from the naturally-acquired disease, the veterinarians of the section being supplied with the necessary materials which may be contained in a package capable of being taken anywhere on a man's head.

Choice of the animal to furnish the vaccine is of great importance. The subject should be young, weaned, in good condition, morning and evening temperature (after two hours resting) not over 40·5, with commencing erosions in the mouth; absence of diarrhœa and of signs of piroplasmosis; no cutaneous lesions (sign of attenuated rinderpest); the body being opened, reject hypertrophied spleens. The product from the mincer is to be at once put in the formolised salt solution and the vessel placed in the dark. It is to be shaken frequently. The practitioner operating in the interior obtains an active product to be used on neighbouring herds at a trifling cost.

Immunisation by Serum, Simple Serotherapy and Simultaneous Inoculation.

As is well known that passive immunity to rinderpest is bestowed on a susceptible animal by subcutaneous injection of the serum of a patient recovered from the malady. This serum is stronger as a protective and curative agent if the animal producing it receives, before being bled, some subcutaneous injections of virulent blood—such an animal is said to be hyperimmunised (fortified). The greater activity of the serum of a fortified animal is, however, denied by Schein and by J. T. Edwards, the latter authority stating that hyperimmunisation is not necessary and that animals reacting to simultaneous (antiserum and virus) inoculation by rise of temperature without symptoms produce satisfactory serum. However, the author of the paper finds that if virulent blood and spleen pulp are used as fortifying agents the serum is four times more active than that produced by the usual method. It may be said, then, that an active serum may be obtained by using an animal recently cured or one having reacted to simultaneous vaccine; yet before abandoning the method of hyperimmunisation new confirmation should be awaited. Recently at Bamako the serum-producing animals receive, after each series of bleedings, virulent blood and peritoneal washings, then a strong dose of old formolised vaccine. The activity of this serum equals that obtained by the old method. Very different opinions are held in the employment of serum alone and of simultaneous inoculation.

In West Africa the latter way may be considered a dangerous arm in the hands of practitioners who do not observe the necessary precautions or who understand badly the local conditions; it was in any case a necessary evil until the introduction of vaccination by pulp of organs.

Conditions in which the Various Methods of Immunisation should be employed.

The climatic and ethnographic conditions vary greatly in West Africa and the means of prophylaxis against rinderpest are there not everywhere the same.

A division may be made between moving herds, those travelling about in search of food and water, and sedentary herds—those remaining in the villages the year round. In the zone of the Niger the former herds are accessible when they seek the neighbourhood of the rivers and they have to be treated only by one intervention.

Here the disease takes on a special character: it shows itself periodically when the dry season brings the herds to the watering places, a great proportion of the affected being young animals, the great majority of the adults being immunised by a previous attack and by successive reinfections; the young while at the teat get a passive immunity through antibodies in the milk, but when weaned soon become susceptible so that it is calves up to a year or a year and a half that mostly die in epizootics in this zone. It is necessary here to immunise periodically at the time when the herds concentrate towards the rivers. Up to a few years ago the simultaneous method was used, giving excellent results but also accidents, causing distrust among the proprietors; these were due not so much to the method as to faulty technique and the method should now only be employed in centres of infection and on animals non-fevered and where the natives have confidence in the operator. The formolised vaccine is the agent to use on the grand scale (in large doses and recently made) material to make the vaccine being obtained from the infected herd, and employed to protect neighbouring healthy herds.

Sedentary herds are easier to manipulate and their owners have confidence in the protective measures and in those who apply them.

Up to now simultaneous (antiserum and virus) inoculation has been largely used on the sedentary herds. On an outbreak being reported, the veterinarian proceeds at once to the place and applies the simultaneous inoculation to all apparently healthy animals in the infected herd; as some of the animals may be in the incubative stage this rapid operation will involve losses among those inoculated, amounting at times to 10 per cent., so that where the full confidence of the owners is not assured it is better to take temperatures and only inoculate the non-fevered subjects. Immediately after operating on the infected herd the neighbouring herds are treated either by the simultaneous method or by formolised vaccine. Where in a mob of cattle many are affected and the malady has been long in existence it may be better to inject antiserum alone, in doses of 30 to 100 c.c., to all animals apparently healthy. An intervention of limited application is to reinforce the immunity conferred by formolised vaccine by a later virulent inoculation.

Sanitary Measures.

These will vary with the country in which the disease is prevalent. In French West Africa, by decree of 1905, slaughter of sick and contaminated animals was ordered, but in a later decree nothing is said about slaughtering; it was wished to avoid hecatombs, but perhaps total suppression of slaughter is not justified: it may at times be necessary. Regulations place rinderpest among the contagious diseases affecting all species of ruminants (cattle, sheep and goats), forbid their movements about the infected area; prohibit removal out of the area of objects likely to spread contagion, and provide for the burial or incineration of carcasses.

Declaration of freedom from infection is only made 48 days after the disappearance of the malady and disinfection

of the locality. Many of the sanitary rules prescribed cannot be acted on in West Africa, where properly to isolate the nomad troops of cattle would, in the dry season, be to condemn them to die of hunger and thirst; to limit the movement of these cattle, however, a great increase in the number of water holes is imperative. Carcasses are more safely disposed of by burying than by burning; the virus rapidly disappears, whereas undestroyed portions of the burnt carcasses may be carried off by animals and spread contagion. In great epizootics where, from want of help, burial or burning is impossible, carcasses may be rendered inaccessible by covering them with branches of thorns. Claverie suggests " pestisation " to shorten the duration of the malady in a herd. The animals (diseased ones first) are examined successively by feeling the mouth and nares. The method is cited because of its originality and to condemn it.

W. R. D.

Rinderpest (Prophylaxis).

By Professor W. Kearney, m.r.c.v.s.
Veterinary College of Ireland, Dublin.

In dealing with the historical aspect of this subject, the author points out that it was not until the second half of the nineteenth century that successful measures were instituted for the suppression of rinderpest.

In Europe, following the recommendations of the veterinary representatives of various European States, subsequent to their deliberations at the first and second International Veterinary Conferences of 1863 and 1865, a policy of suppression by sanitary and police measures alone was sucessfully applied. These measures included the slaughter of affected cattle and their in-contacts, the imposition of quarantine on infected localities, the disinfection of infected premises and the establishment of quarantine stations on the Russian Frontier in order to prevent further infection from that country, which was then recognised as the home of the disease. These measures, while succeeding in freeing Western Europe of the disease, necessitated an enormous outlay of money.

He then describes the evolution of prophlaxis by immunisation, which began with Semner's discovery of anti-rinderpest serum in 1895 and which was closely followed in 1897 by the discovery of the immunising properties of the bile of affected cattle. He points out the drawbacks of the bile method, namely, instability of the immunising properties of bile, the short duration of the immunity set up and the high cost involved to procure sufficient suitable bile. Although bile inoculation was used extensively in combating the epizootic which swept South Africa in 1896 and subsequent years, it was replaced in time by the use of anti-rinderpest serum.

It is chiefly to Danysz and Bordet as well as to Turner and Kolle working in South Africa contemporarily that we owe the methods of prevention by immunisation that are in common use to-day, *viz.*, passive immunity by the use of antiserum alone, and active immunity by the use of antiserum and virulent blood injected simultaneously. Their results were published in 1897. Turner stated, in September of that year, that " the best way to immunise healthy cattle is by injecting into them 1 c.c. of virulent blood on one side and a dose of serum on the other." The antiserum used by these investigators was prepared by hyperimmunising cattle with repeated doses of virulent blood.

Following the successful extermination of rinderpest from South Africa in 1903 by the use of bile and serum aided by quarantine measures, other countries in which the plague was indigenous readily took up the attack along the same lines, except that bile soon fell into disfavour. The attack, however, did not meet with the same success as in South Africa and rinderpest still continues its destructive progress in most of those countries.

The author then criticises the present-day methods of prophylaxis and states that " in my opinion this (serum-simultaneous immunisation and quarantine) has been the most reliable and most economical means at our disposal up to now for the suppression of rinderpest, and the prevention of its spread, in countries in which the disease is indigenous, provided that the transmission of other diseases by the virulent blood can be avoided or will not cause undue mortality in the treated animals." He emphasises the difficulty met with in immunising young calves and considers that the resistance of these animals is to some extent associated with age rather than being solely an immunity acquired from the milk of immune mothers, which is the common belief.

Finally, he reviews the published accounts of the virus-vaccination investigations now being carried out in several countries and describes the method on trial in Nigeria which he initiated in 1927. It would appear from these investigations that a reliable means is now at hand by which susceptible cattle can be immunised without danger to themselves or to in-contact animals. In Kenya Colony, for example, it has been found that a solid active immunity can be set up in susceptible cattle with a vaccine prepared by macerating the spleen pulp of an affected animal in a solution of formalin varying in strength from one in 1,500 to one in 2,000 of water. It is claimed that cattle which receive this vaccine do not convey rinderpest to in-contact animals and, further, that the vaccine does not transmit protozoal or other blood diseases, even though it is made from the spleens of animals affected with such diseases.

Despite the apparent success of this new method, the author considers it will still be necessary to manufacture and employ anti-rinderpest serum, in order to deal with outbreaks of the disease, since the virus-vaccine is incapable of setting up an immediate protection in in-contact animals such as antiserum does.

The author concludes his paper by recommending to the Conference Delegates the desirability of adopting an international plan of campaign against the disease.

Erratum.—In the report of Mr. Donald Campbell's remarks to the West of Scotland Division (*V.R.*, Vol. xi, No. 3, page 68, column 2) the following is stated : "Cases of milk fever occurred in cows before eating, and at quite long periods after eating." For " eating," read " calving."

Protective Inoculation of the Domestic Animals against Rabies.

By Professor Dr. A. Aujeszky.
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Protective inoculation can be of two kinds, that carried out after infection and that performed as a preventive measure against possible future infection.

Ruegelstein made the first attempt to immunise animals against rabies in 1826 by treating dogs with the saliva of rabid cows, but without success.

Galtier, in 1879, succeeded in immunising sheep and goats by repeated injections of the saliva of rabid dogs, later using emulsions of spinal cord. According to Roux and Nocard, this method was not suitable for practice as it sometimes caused the disease instead of affording protection against it. In 1880 Pasteur produced the fixed virus and worked out methods of immunising man and animals, but those methods are not convenient for use in general practice owing to the long period necessary for the development of the immunity and to the frequent calls on the time of the practitioner.

Post-infectional Inoculation.

Remlinger's method: inoculation with fixed virus attenuated by æther. This has proved to be very useful; it is quick in action and only requires one inoculation, but the material does not keep for long. The inoculation into animals is well borne, although some workers report untoward sequelæ of a local or general nature.

Finzi has done much work on the subject in Italy with Remlinger's method, but with the variation of dividing the complete amount of inoculum into six parts given over three consecutive days, the first dose of brain material having been ætherised for 6 hours, the second for 24 hours and the remaining four for 12 hours. For the production of strong immunity in large animals at least 3-3·5 gm. of rabbit brain are required, and for calves and goats 2-2·5 gms. Inoculation with virus weakened by carbolic acid after the method of Umeno and Doi has been much employed in recent years, particularly prophylactically for dogs. Carbol-glycerinised virus has also been employed for various animals, but there is difference of opinion on the number of doses required. This virus is useful both before and after infection, few doses need be given and the material is conservable. Finzi used this virus considerably for horses and cattle, giving six doses over three days.

Schern tried double post-infectional inoculation for cattle, but the results were not certain.

Uher and Macek claim good results in inoculating horses with ½ gm. of carbolised virus.

Stuart and Krikorian's protective method for man and animals, used in Palestine, is not convenient for veterinary practice, because of its lack of simplicity. In countries in which there is no law to order the destruction of infected or suspected dogs, inoculation after the Japanese method is of value and two or three inoculations are advisable.

Finzi, for protective inoculation of dogs, uses three inoculations in three days of fixed virus from canine sources and, in order to produce an "aspecific immunity" adds normal dog brain. The three doses are progressively stronger and, in all, the bitten dog receives in the three days 1·21 gm. fixed virus and 2·49 gm. of normal brain. Dogs over 15 lbs. weight are given twice this amount.

Fermi's "Antilyssin," a mixture of carbolised virus and equine immune serum, although effective, is not at all suitable for use in practice, owing to the numerous doses required to be given (two daily for 15-25 days).

The same applies to the "Autovaccine" method of Puntoni.

Formalin may be used to kill or attenuate the virus, in 1 per cent.-4 per cent. strength (methods of Puntoni, and Plantereux).

Virus attenuated with glycerine has been used by the Government Institute of Tokio, being applied post-infectionally in two or three doses.

The original Pasteur method, used by Orlowski for animals, and Koch's modification of it, are no longer employed because of their tediousness.

Hoegyes' original dilution method has been used in Hungary since 1900 and Aujeszky has modified it for practical use in veterinary medicine. It is prepared in the Budapest Royal Hungarian Veterinary High School and consists of 6-7 doses, given at 24 hour intervals, and is sent by post in two or three lots, each lot to be used within four days of dispatch. For post-infectional inoculation for adult horses and cattle, application is as follows:—

First day	... ...	5 c.cs. of dilution	1 : 200
Second day	... ...	10 c.cs. ,, ,,	1 : 200
Third day	... ...	5 c.cs. ,, ,,	1 : 100
Fourth day	... ...	10 c.cs. ,, ,,	1 : 100
Fifth day	... ...	5 c.cs. ,, ,,	1 : 50
Sixth day	... ...	10 c.cs. ,, ,,	1 : 50
Seventh day	...	5 c.cs. ,, ,,	1 : 25

The seventh inoculation is only practised in cases of severe bite wounds and occasionally an eighth inoculation is given (10 c.cs. of 1 : 25 dil.).

The method is applicable for animals of different species and size, and dosage is adjusted accordingly. Dogs and cats are not treated in Hungary: infected ones must be destroyed. In statistics given in the paper on results obtained between 1900 and 1928 in Hungary, only 0·54 per cent. of inoculated animals died later from rabies, many of which were not definitely infected but only suspected of possible infection. Of 607 certain cases of wounds caused by a rabid dog, 27 (4·4 per cent.) died in spite of inoculation, and this is good when compared with the natural mortality of rabies of 70-80 per cent.

Lipovaccine, fixed virus emulsified with oil, is useful as proved experimentally, but its practical value remains to be demonstrated.

It is desirable that methods of the future should be as simple as possible, should require only one or two doses, should not need much material and should be free from any danger of causing the disease whilst conferring a certain immunity against it. At present the dilution method of Hungary is about the best. Ætherised and carbolised virus are reliable and such can be given to pregnant animals without danger, and milk of inoculated animals is unaffected when inoculations are made subcutaneously.

One forunate point about rabies is the long incubation period. Protective inoculation may be employed with good prospects of success many days after the infliction of the injury. It was found that the incubation period exceeded one month in 50 per cent. of a large number of cases in

the horse and bovine and was somewhat shorter for pigs. Therefore treatment should be undertaken even if some weeks have elapsed since infection occurred. According to Uher and Macek, horses can be immunised by ½ gm. of virus killed by carbolic acid.

PREVENTIVE INOCULATION OF DOGS.

The question of what shall be done with dogs is, of course, of the greatest importance, as this animal is responsible for the natural infection in all animals. There is a difference of opinion among experts as to whether dogs or not should be subjected to inoculation. The results obtained in England, Belgium, Denmark, Norway and Sweden, purely with veterinary police measures, show that rabies can be eliminated without preventive inoculation. The method of immunisation of Umeno and Doi of Japan, using a single inoculation, has given good results on the whole but is not absolutely free from occasional failure to prevent the disease, as several workers have found. In a few cases the inoculation has produced the disease, caused paralysis or subsequent skin lesions (dermatitis: eczema).

Aujeszky considers that the conflicting results obtained with the Japanese method are due to the lack of uniformity in the virulence of the virus and its method of preparation; he has always obtained perfectly good results with it (slightly modified method).

Cases of post-inoculation rabies are practically always of the " dumb " type, so that the probability of propagation of the disease from this source is absent. With regard to the question of the virulence of the saliva of inoculated dogs, only one isolated case has been reported (by Dahmann and Hasenkamp) in which this did occur. This point need not be taken into consideration in practice. Other methods of immunisation of dogs are those of Kondo, Finzi (fixed virus mixed with normal brain), Kii (carbol-glycerinised virus), Ustupny (10 per cent. fixed virus emulsion), Miessner (virus treated by desiccation, so-called " Lyssin "). The methods of Remlinger and Bailly, and Schnürer are not well suited to practice, because of the three and four injections required to perform them.

A number of statistics from Japan and other countries are given and the proportion of inoculated dogs which developed rabies is minute, but one cannot gain precise information on the value of immunisation because the total number of uninoculated dogs which did not get the disease is not given and apparently a good proportion of the dogs which were inoculated had not been actually infected at all.

In conclusion, and on the question of the value of preventive inoculation of dogs as a part in our fight against rabies, the author is of the opinion that this can without doubt offer appreciable support to a well-designed veterinary police campaign, but that it cannot take the place of administrative measures. Government orders can quite well cope with the disease in a slightly infected country, but immunisation is very advisable in a place where it is widespread.

As the exact period of duration of immunity conferred by inoculation is unknown, it should be repeated every year on dogs and the material should only be prepared by supervised laboratories and efforts made to produce it more cheaply. Dogs that have undoubtedly been bitten by a rabid dog should be destroyed whether or not they have been immunised, or else early cases, treated appropriately, should be quarantined for six months.

Cats and other domestic animals should not be subjected to preventive inoculation, as a general rule.

J. T. E.

Rabies (Vaccination).

By PROFESSOR GUIDO FINZI,
Director of Special Pathology Laboratory and of the Medical Clinic, Veterinary College, Milan.

The international Conference on Rabies, held in Paris, April, 1927, recommended :—

(1) that preventive vaccination of dogs against rabies should be practised. Whenever possible, a single inoculation of virus, killed but yet capable of immunising, or of fixed virus, modified or unmodified, should be used.

(2) that vaccination should be repeated annually.

(3) that vaccination should be done only by anti-rabies institutes, by veterinary colleges, or by a responsible State veterinary official.

(4) that a census of vaccinated dogs should be made and the animals inspected by a veterinarian four months after vaccination.

(5) that administrative control should be suspended as soon as a sufficient number of vaccinations have been made.

(6) that there should be reasonable discrimination in the vaccination of bitten animals. Dogs bitten by animals undoubtedly rabid should be destroyed whether they have been vaccinated or not. Dogs which are only suspected of having been bitten could be vaccinated on condition that they were isolated for at least six months.

(7) that in no case should cats be vaccinated as a preventive or as a curative measure.

As to other species of animals, it is recommended :—

(1) that preventive vaccination of animals other than domestic carnivora should be done only in districts where rabies is prevalent.

(2) that the vaccine used should be killed, but yet capable of immunising, or fixed and modified or unmodified.

(3) that vaccination of bitten animals is desirable.

(4) that the vaccine used should be as recommended in paragraph 2.

(5) that vaccination should be performed within four days following the bite; or at the latest within 10 days.

(6) that animals which have been bitten by a rabid animal should not be passed as fit for human consumption during the period from the eighth day to the third month after the bite, whether they have or have not been treated.

The author wishes to point out several arguments in favour of vaccination.

1. It is too readily assumed that rigorous sanitary control can be imposed in all countries.

2. On account of popular sentiment it is difficult to apply measures similar to those used in the control of contagious pleuropneumonia of cattle and rinderpest.

3. The percentage of cases of rabies in 370,117 dogs vaccinated in Japan in the years 1923-1925 was only 0·013 per cent.

4. The results of vaccination in U.S.A., where anti-rabies vaccination has been done on a very large scale, have not been completely examined.

5. Advantage has not been taken of the latest methods of preparing vaccine.

For preventive vaccination of dogs the author uses a single type fixed virus made from dogs and emulsified in glycerin-phenol solution.

For curative vaccination, the same vaccine is used, but a series of three injections at 24 hour intervals is made. The vaccines keep for six to seven months, reactions after inoculation are slight and rabies cannot be produced by their use. Moreover, the vaccine contains homologous cells and products only.

The immunity induced by a single injection lasts eight to 12 months.

The author has vaccinated 23,000 normal dogs and 300 bitten dogs by these methods, and has obtained excellent results. Vaccination should be done early or at least not later than 12 to 15 days after the bite. If vaccination is applied later than this, the result may be positive or negative, depending on the case and the circumstances. It is positive when the vaccine virus reaches the central nervous system, the street virus having been destroyed in the tissues or excreted in the saliva, destroyed in the peripheral nerves, or has arrived in the central nervous system simultaneously with the vaccine virus. It may be positive when the street virus is in small amount or modified in virulence. It may sometimes be positive when the nerve cells are capable of resisting and destroying the street virus. The result is negative when the street virus has reached the central nervous system before the vaccine virus and has already overcome the resistance of the tissues. In this case the period of incubation is generally short. It is also negative in those cases where the street virus remains latent in the nervous system, the disease appearing after a long period of incubation. It is also negative in those rare cases where the vaccine virus fails to set up immunity. The immunity set up by vaccination is humoral as well as cellular. Rabicidal antibodies appear in the serum of immunised animals.

Curative Vaccination of Horses and Cattle.—The author has had good results with Remlinger's etherised fixed virus, glycerolated phenolised rabbit virus, but now uses glycerolated-phenolised fixed dog virus. Vaccination should be commenced as soon as possible after the bite, on the first day if possible, not later than the 12th to 15th day. Injections should be given twice a day for three days. The vaccine may be used on pregnant and lactating animals without ill effects.

C. McG.

United Hunts Ball.

The first United Hunts Ball ever held in London took place at the Savoy Hotel on Thursday, January 15th, in aid of the Royal Veterinary College Rebuilding Fund.

In spite of the fact that the date clashed with that of several local hunt balls, no less than thirty hunts were represented, and the guests numbered nearly 800.

Many members of the profession took parties.

Clinical and Case Reports.

Some Nervous Disorders in Cattle.

By J. B. White, M.R.C.V.S., Salisbury.

In the afternoon of December 6th, 1930, we were asked to go and see a cow which was having fits.

On arrival, we found a very nice light roan shorthorn cow, lying flat on her broadside in a field and quite obviously in a fit.

She was sweating profusely, breathing quickly, snorting, and she showed the usual fleck of foam on the lips. Any movement before her eyes caused an attack of clonic spasms of the neck, leg and back, combined with twitchings of the facial muscles and rolling of the eyes.

The fæces were practically normal, barring slight looseness attributable to excitement. Her temperature was 101·5° F.

With careful drenching she was given ʒii. of chloral and in about 15 minutes was able to rise, after which she was slowly walked home, in spite of being very staggery for the first hundred yards or so.

She was then given a saline aperient, and further doses of chloral were given during the evening.

This cow was a second calver, having been calved about two months, and was then giving three gallons of milk a day.

December 7th.—The cow was now fairly steady on her legs, with no signs of further fits, but still showed facial twitchings and photophobia, while, on anyone approaching, she was inclined to bellow.

She had drunk and eaten a little food besides giving nearly a gallon of milk. The aperient had acted quite well and further chloral was prescribed.

December 8th.—Cow was found dead, apparently having had another fit. No *post-mortem* was made.

December 9th.—We received a message that two more cows were affected.

No. 2 cow was a fourth calver, calved about a month, which had come in with the remainder of the herd for milking, and given 1½ gallons of milk. After milking she had suddenly dropped in a fit, and had had a second one before we saw her.

We found her looking very wild and lying in the gutter, sweating, with the same twiching of the facial muscles as the previous cow.

She was propped up and given ʒii chloral with ʒi Tinct. belladonna, but no aperient, and was later got into a loose box.

Cow No. 3, a third calver, had been calved six weeks and had come in, like the other, giving her usual quantity of milk, but had fallen down when turned into the yard—without, however, having a fit.

This cow also had a wild appearance, showing facial twitching, unsteady gait and photophobia. Her temperature and bowels were normal.

From her appearance she had evidently had a fit the previous night.

Drenching caused a temporary aggravation of the symptoms, and any slight unusual sound or movement was

sufficient to upset her. In spite of this, she was willing to feed in the quiet intervals. She was given medicine similar to cow No. 2. It was now advised that the remainder of the herd should be taken off all cake and allowed only grass, hay and bran.

December 10th.—Cow No. 2 dead, after being practically unconscious all night.

The *post-mortem* on this cow revealed inflammation throughout the fourth stomach, small and large intestines, with petechial markings on the mesentery. Liver and kidneys were apparently normal. The heart showed extensive ecchymoses, particularly so on the auricles, while odd patches were seen on the surface of the lungs. Cow No. 3 was fairly steady, feeding moderately, cudding, bowels normal and had given a gallon of milk that morning.

Drenching caused a slight recurrence of muscular symptoms and she was restless, like a cow with early milk fever symptoms.

Cow No. 4, a third calver, and calved about two months, had been seen " gidding " the previous evening and given a sedative dose.

She now appeared fairly normal, though still slightly unsteady, and from twitchings appeared as if she was excited. This cow was feeding, bowels normal, and giving her usual quantity of milk.

December 11th.—Cow No. 3 was feeding well, cudding, milking, and looking better generally, being less readily excited.

Cow No. 4 was also better and the nervous symptoms were abating.

Cow No. 5, a fresh case, had not cleared up her food that morning and was kept back. The symptoms were chiefly muscular tremors, and an unsteady gait, with but few twitchings of the face.

December 12th.—Cow. No. 3 practically normal, except for a rather uncertain gait. Cow No. 5 much the same as on previous day, except that she was feeding better.

December 13th.—Nos. 3 and 4 proceeding normally, and No. 5 on the road to recovery.

This herd was a T.T. herd of non-pedigree Shorthorns, not very heavy milkers on the average, and numbering between 20 and 30 cows.

They were still lying out at night, in a meadow with a very fair bite of grass for the time of year. In addition, they each received an armful of hay in the morning and from 6-8 lbs. of cake during the day. The cake ration consisted of :—

Undecorticated cotton cake	40 per cent.
Decorticated ground earth nut ...	40 per cent.
Linseed cake	10 per cent.
A proprietary cake, containing 20 per cent. nitrogen	10 per cent.

The nitrogen ratio for the above mixture is extremely narrow, so that for the milk yielded they were probably getting excessive quantities of protein.

This particular ration had been fed to the herd for about two and a half months. The cessation of cases on stopping the cake seems to prove that this was the cause of the trouble.

If, on the other hand, the cake had contained poisonous seeds he would have expected greater digestive disturbance, which was practically absent, despite the inflamed condition of the intestines of cow No. 2.

A Peculiar Disease of Dogs.

By Z. Morcos, M.V.Sc., F.R.C.V.S., D.V.H
Professor of Bacteriology, Cairo Veterinary College.

Early in 1929, the following cases were examined :—

Case 1.

Saluki fawn dog; hind limbs paralysed, very excited, signs of great pain, biting its chain and eating its bedding. Clinically, the disease looked like rabies. The animal died 24 hours after admission.

Post-mortem :

Chest cavity — lungs slightly congested; pericarditis and pericardial fluid tinged with blood.

Abdominal cavity — pyloric end of stomach highly inflamed, cardiac normal; liver congested, looking almost black; gall bladder distended and full of dark thick bile; kidneys inflamed; urinary bladder distended and full of thick urine containing albumen; spleen normal; intestines showed patchy catarrhal inflammation.

Brain congested.

Case 2.

Fawn Saluki dog, which had been in contact with case 1. The dog was totally paralysed, exhausted and died a few hours after admission.

Post-mortem :

The outstanding characteristics were pyloric gastritis, distended gall and urinary bladders.

Case 3.

Greyhound red dog; arrived for *post-mortem*, with a history of suspected rabies, on account of continuous crying and paralysis.

Post-mortem :

The already-described constant lesions in case 2; in addition, the lungs were congested.

Case 4.

Cross-bred dog was seen biting itself and eating the bedding; a few days later paralysis set in and it died on the 20th day after the first signs of sickness.

Post-mortem :

Pyloric end of the stomach deeply discoloured, with no ulcer formation; gall bladder five times the normal size and full of thick bile; rectum revealed longitudinal inflammatory stripes.

Cases 5, 6, 7, 8, 9, and 10 were Armanti dogs, which had been in contact with an infected dog.

Five died between the 25th and 45th days with the same *post-mortem* lesions; only one white dog recovered. Three dogs showed itchy lesions, one of the three revealed Demodex.

Bacteriological Research.

Films were made from the blood, exudates and internal organs of all the cases and were examined, with negative result.

Media were inoculated with the blood, exudates and internal organs from all the cases, incubated ærobically and anærobically, with negative result.

Inoculation of Laboratory Animals.

Guinea-pigs, rabbits, white rats, cats and dogs were used. Laboratory animals were inoculated with filtered

and non-filtered material of the dead dogs—blood, pericardial exudate, saliva, nasal discharge, bile, urine, gastric juice and brain emulsions.

The material used for inoculation was diluted with sterile normal salt solution 1/20.

Seitz filter, three inches diameter, and Chamberland candles L5 and L3 were used.

Guinea-Pigs.—Whether the material was filtered or not, the Virus was pathogenic to guinea-pigs. Period of incubation was shorter when the material was inoculated subcutaneously, at the neck behind the occipital region.

Bile was most virulent; dose used ½ c.c. of the material. All the body fluids, secretions, excretions, and tissues inoculated, proved virulent to guinea-pigs, which died between the third and 20th day of inoculation without any paralysis.

The disease was passed from guinea-pig to guinea-pig.

Post-mortem.—Most marked were the highly-congested liver, nephritis, and distended gall and urinary bladders.

Rabbits were inoculated with filtered and unfiltered material, ½ c.c. at the occipital region. The occipital region was preferred by Professor Carpano, who had a previous wide experience of the disease.

The virus proved pathogenic to rabbits, which died between the third and 25th day after inoculation, with the same *post-mortem* picture as in guinea-pigs. Rabbits also died without paralysis.

White Rats did not show any signs of the disease on being inoculated.

Two Adult Cats were inoculated with Blood and Bile with negative result.

Experimentally inoculated dogs and dogs in contact with those suffering from the disease, *died* within 14 and 45 days.

Twelve dogs were in my charge and only one recovered, which became blind, due to cortical lesions in the central nervous system (the fundus showed no abnormality) (see photo).

On *post-mortem,* the same lesions as in the naturally-infected dogs.

Summary and Discussion.

The disease is highly infectious and very fatal, the death rate being about 95 per cent.

All secretions and excretions and body fluids, filtered or not filtered, are infectious to dogs, guinea-pigs and rabbits.

The fact that inoculated rabbits and guinea-pigs *die* without *paralysis excludes* rabies.

According to Laidlaw and Dunkin, the distemper *virus* is non-pathogenic to laboratory animals.

On the inoculation of laboratory animals with pseudo-rabies, Aujeszky noticed severe itching and death in 50 hours, but in this peculiar disease, itching was not seen to occur in the inoculated animals, and the average time between the inoculation and death, was 3 to 20 days. Again, in pseudo-rabies (Schmiedhoffer) rats are susceptible, but in this disease white rats were resistant.

Marek reported pseudo-rabies in cats, regardless of age; but the two adult cats inoculated did not suffer or succumb.

Marek reported the inactivity of bile in pseudo-rabies; while, in this peculiar disease, bile was most virulent.

Finally, Stuttgart disease (canine typhus) should be discarded, because of:

(*a*) absence of ulcerative stomatitis;

(*b*) absence of violent vomition and the almost characteristic offensive oral smell;

(*c*) the fact that it is highly contagious and of shorter duration.

Two charts of experimental dogs:—

TEMPERATURE CHART 1.

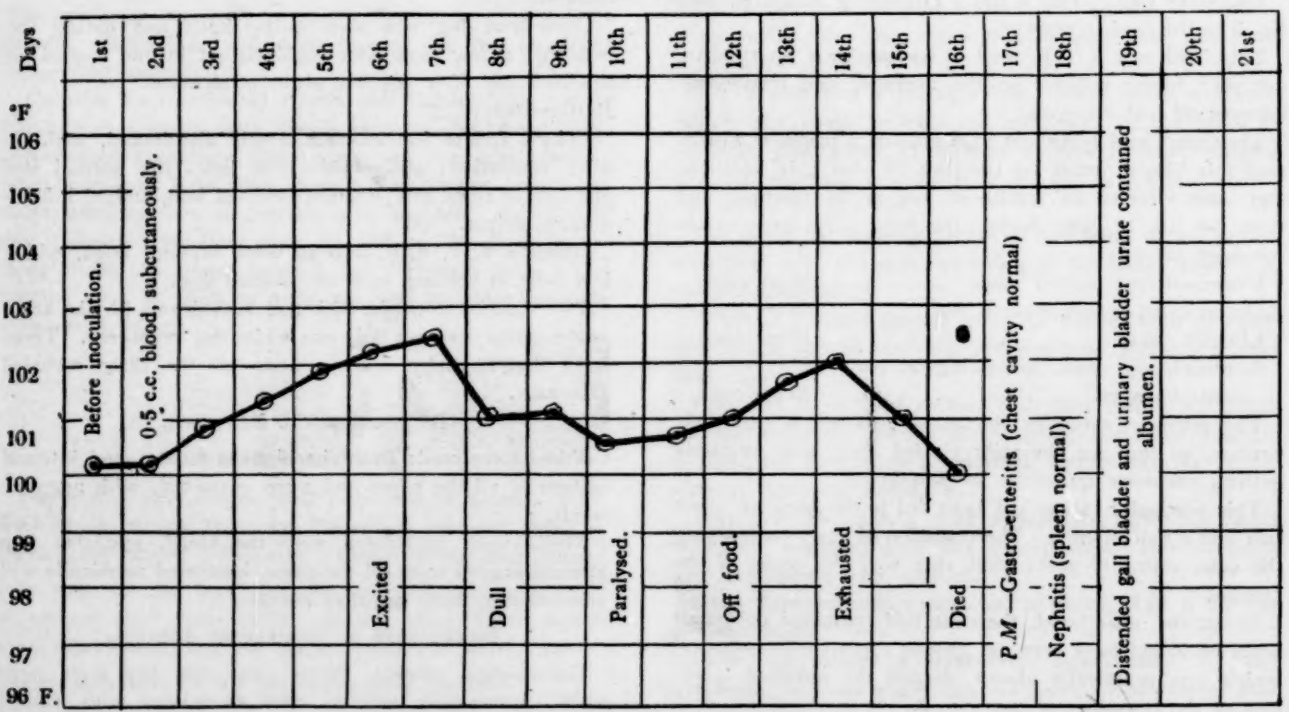


Chart 1 of a dog inoculated with filtered bile.

TEMPERATURE CHART II.

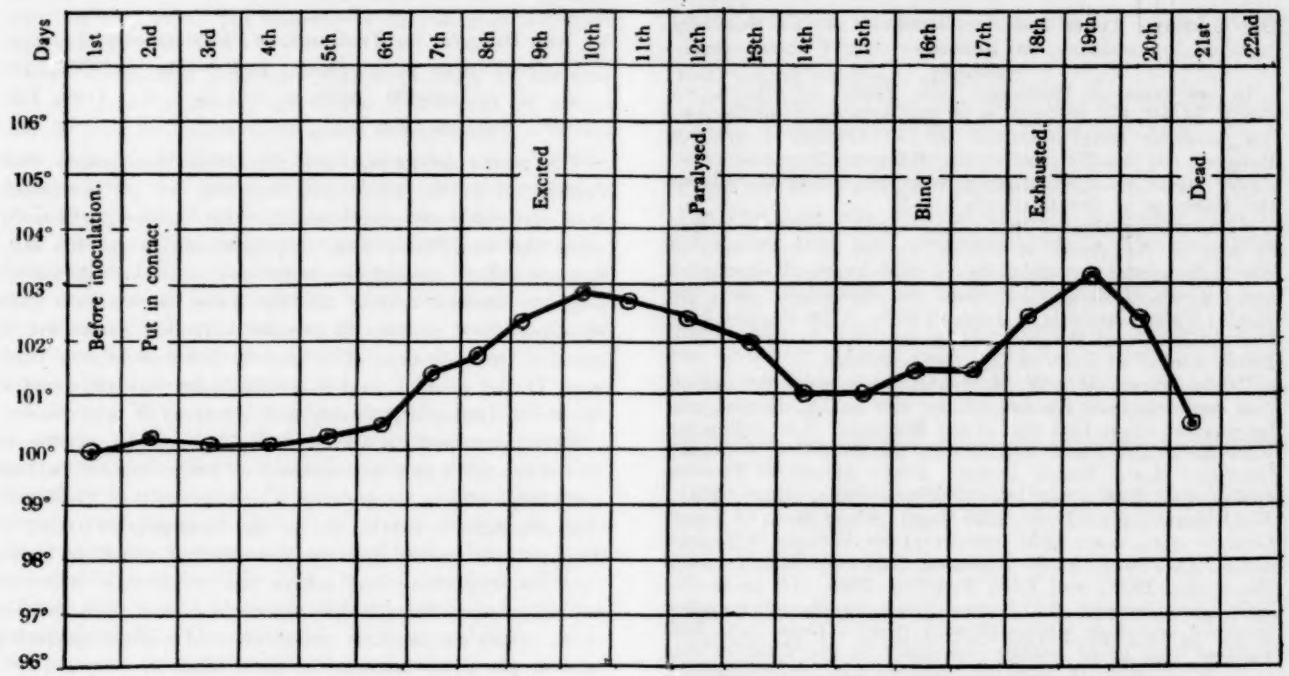
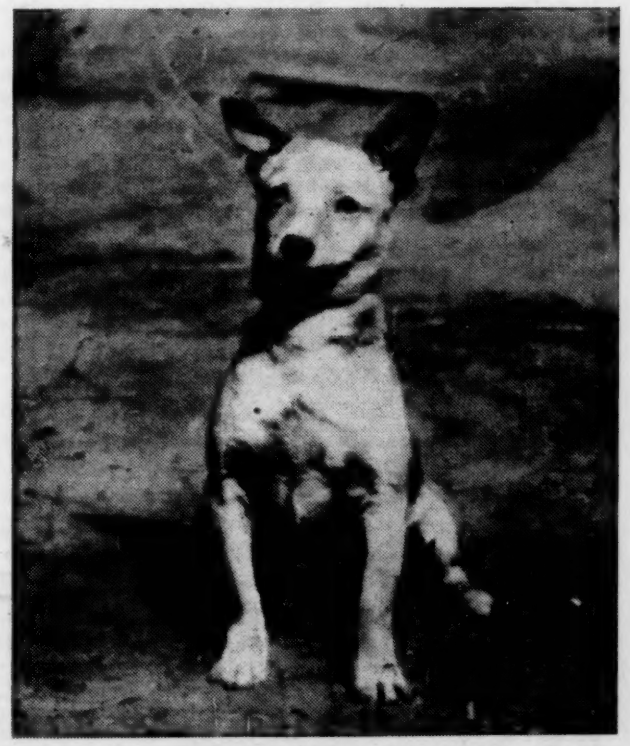


Chart 2 of a dog left in contact with inoculated dog.

An experimental dog infected: early stages.

The same dog became blind after recovery.



The same dog getting over the disease.

Personal.

DR. GRIFFITH EVANS RECEIVES FREEDOM OF THE BOROUGH OF BANGOR.

In our issue of December 13th, 1930, we offered, on behalf of all his colleagues in the veterinary profession, our heartiest congratulations to Dr. Griffith Evans, of Bangor, on the decision of the Bangor City Council to confer upon its distinguished veterinary-scientist resident the Freedom of the Borough.

" ' In recognition of the distinguished services rendered by him to the cause of science and as an expression of the high esteem in which he is held by the Corporation and Citizens of Bangor,' to quote the resolution," says the *North Wales Chronicle* of January 16th, " the Bangor City Council conferred the freedom of the city on Dr. Griffith Evans who is 96 years of age and bedridden.

" The Mayor (Mr. W. R. Jones), in moving the resolution conferring the freedom of the city on Dr. Evans, said he was the tenth Freeman of the Borough. The following were the others whose names were on the roll of honorary freemen :—Lord Baden Powell, 1903; Alderman Thomas Lewis, J.P., 1907; Sir John Prichard Jones, Bart., 1911; Field-Marshal Earl Haig, 1920 (July); Right Hon. D. Lloyd George, M.P., O.M., 1920 (October); Sir Richard Williams, O.B.E., J.P., 1921; Lady Williams, 1921; Sir Henry Lewis (Kt.), J.P., 1922; and Lord Penrhyn, 1926. Of these five had gone beyond the bourne from which no traveller returned and four were still with them. Those who had received this great honour previously at the hand of this Council could be divided into two classes—those who had given great and unstinted service to this city, and those whose work was of national, and perhaps international, importance.

" ' Dr. Griffith Evans has been an excellent citizen of Bangor for many years,' said the Mayor. ' He was always in the forefront in support of what was noblest and best, yet the great work for which he was justly held famous, and for which we are now doing what we can to honour him, is of world-wide importance. It is work from which the whole of the human race has benefited.' " (Hear, hear.)

Dr. J. E. Thomas, in seconding, observed that the discovery of the " trypanosome " was an epoch in scientific research, and this contribution to science was recognised as one of international importance. It was not only the discovery itself, but the lead it gave to future research workers. The discovery of the cause of infectious disease after this time was due primarily to the principle laid down by Dr. Evans—that the circulating blood was the carrier of the infectious germ, and that in consequence the blood examination revealed the cause of the disease.

Mrs. Garfitt, of Ryde, Isle of Wight, Dr. Evans' eldest daughter, said that she had been deputed by her father to thank the Council for the honour they had conferred upon him. He felt the honour very deeply. It was said that " prophets were not acknowledged in their own country," but that could not be said of Bangor.

Psittacosis of Birds and Man.

Five outbreaks of psittacosis have occurred in the United States. The outbreak of 1929-30, however, seems to have been the most important one. The Public Health Service have a record of 74 foci of infection, which gave rise to 169 cases with 33 deaths from November 24th, 1929 to May 7th, 1930. These cases do not include 16 laboratory cases with two deaths, nor 12 cases removed from merchant ships entering our ports.

The disease is highly communicable from birds (parrots, parakeets, etc.), to man. It is much less easily communicated from bird to bird. Instances of infection are rare if they occur at all, which is doubtful.

The prevention of psittacosis in man is simple. It consists of the avoidance of contact with tropical birds.—*Veterinary Medicine.*

Abstracts.

[**A New Drug for the Treatment of Piroplasmoses.** THEILER, A. *Bull. Soc. Path. Exot.* 1930. May 14. Vol. 23. No. 5. pp. 506-529. With 22 text figs. Ex. *Trop. Vet. Bull.* Vol. 18. No. 4.]

The author points out that trypanblue has had a wide application in the successful treatment of piroplasmosis, both natural and experimental. But, more particularly since the war, there have appeared on the market substances called trypanblue which not only are devoid of any parasiticidal action, but are liable on injection even by experienced persons to produce alarming symptoms of shock. In the course of a tour in Queensland two years ago, Theiler heard it said that trypanblue was quite useless for the treatment of redwater as it occurred in that country.

This fact caused the author to decide upon the publication of the results which he obtained at Onderstepoort in 1925 and 1926 with a new drug which he calls " Piroblue." The experiments carried out in the Sandoz laboratories by Müller have shown that the parasiticidal action of stains such as trypanblue and others can be greatly increased if they are combined in an appropriate form with the bile acids. This combination can be effected without producing any proportional increase in their toxicity.

The bile acids and their salts possess no parasiticidal power of their own, but their association with pure trypanblue renders it possible to reduce the dose of the drug to a point at which toxicity does not come into consideration at all. Not only so, the parasiticidal action is actually increased.

According to Stoll, the explanation of this effect is probably as follows: Bile acids exert a profound effect upon the surface tension of liquids containing them. This fact is made use of commercially in dyeing, and this property enables drugs combined with them to come into closer contact with parasites.

Two compounds, which are called T 18 and T 19, were used for experiment. These were composed of the pure dye and sodium cholate in different proportions. These compounds possessed similar properties, and it was decided to make one intermediate in composition between these for commercial application.

The toxicity of " Piroblue " was tested upon mice, but, in spite of the use of a large series of animals (nearly 100) the results were, for some unknown reason, discordant.

A series of guinea-pigs was placed under test by intravenous injection. In the majority of cases a five per cent. solution was used, and doses were graduated so as to give 0·1 g. per kilog. upwards. In this series concordant results were obtained, and the toxic dose by intravenous injection was found to be 0·19 g. per kilog.

Full details are given of twelve observations carried out on pure-bred Polled Angus cattle, five upon African native-bred animals obtained from areas free from piroplasmosis, and five upon horses. Four of the latter were animals undergoing hyperimmunization against horse sickness, the other a sporadic case. One of the animals was infected with *P. caballi*, and the other four with *Nuttallia equi*. The whole of the seventeen bovines used were infected artificially with *P. bigeminum*. Of the twelve Scotch animals six developed hæmoglobinuria, as did also two of

the African cattle. The blood used was therefore of considerable virulence. The majority of animals also developed high fever.

Both compounds T 18 and T 19 were used, in one and two per cent. solutions, and doses of 100 c.c. for adults and 50 c.c. for calves were given intravenously. In no case was any evidence of shock observed. One of the African cattle was given 50 c.c. of four per cent. solution of T 18 without producing trouble of any kind.

In every case the temperature promptly fell and parasites disappeared from the circulation within 24 hours, and there was a rapid and surprising improvement in condition. In one case death occurred, but the calf in question should not have been put under treatment, as it was suffering from a paratyphoid infection.

T 18 and T 19 do not produce complete sterilization, as is shown by the fact that in eight instances parasites reappeared in the blood in small numbers some days after their first disappearance. This is not an undesirable result, because premunization against piroplasmosis depends upon the persistence of the parasite in the blood. The new drug is suitable, therefore, for use in the premunization of animals, and it can be given without risk to valuable imported animals. The possibility of using solutions up to four per cent. strength permits of a reduction in the amount of liquid injected to reasonable proportions.

Until further experimentation has furnished fuller information Theiler recommends the following doses:—

For calves or slight cases:—

50 c.c. of a 2 per cent. solution in water.
or 100 c.c. of a 1 per cent. solution in water.

For serious cases in adult animals:—

50 c.c. of a 4 per cent. solution in water.
or 100 c.c. of a 2 per cent. solution in water.

All the animals treated in the experiments had been infected by the injection of virulent blood, but the author sees no reason why similar results should not be obtained in naturally contracted cases.

The four cases of equines infected with *Nuttallia equi* were all cured, but Theiler recommends caution for the time being in drawing conclusions as to the efficacy of the drug against this parasite. The first case treated was a severe one and two injections were necessary to cause the disappearance of the parasites. In the other cases the disappearance of the parasites was not immediate, and the temperature remained high for 24 hours after the injection. It must, therefore, be concluded that the drug is probably less active against Nuttallia than against Piroplasma. The fact that a case of nuttalliasis with hæmoglobinuria recovered after two injections is sufficient to recommend the use of the drug, more particularly because up to the present no known drug has been of any value for the treatment of this condition.

It is suggested that Piroblue will probably prove effective against canine piroplasmosis and against diseases caused by Babesiella, but the author notes, without giving any details, that it is quite without action on *Theileria parva* and Anaplasma.

[**Undulant Fever, an Occupational Disease of Veterinary Surgeons.** Conte, A., *Rev. Gén. Méd. Vét.* 1930. June 15. Vol. 39. No. 462. pp. 321-324. Ex. *Trop. Vet. Bull.* Vol. 18. No. 4.]

The author, who is Inspector-General of Veterinary Services, publishes the results of an enquiry carried out in south-eastern France regarding the prevalence of undulant fever among veterinary surgeons.

It was found in the first place that cases occurred in certain Departments: Pyrénées-Orientales, Aude, Gard, Var, Basses-Alpes and Hautes-Alpes. These are the areas where the sheep and goat populations are the most dense. The first case was detected in 1910, and since then 12 other cases have been encountered; ten of these since 1924. In practically every case the circumstances have been practically the same, namely, the handling of sheep or goats which have aborted. In some cases farm hands helping the veterinary surgeon have also become infected. In one instance neither sheep nor goats were concerned, but the veterinary surgeon had been called upon to intervene at a parturition on premises where several cases of abortion had occurred.

The enquiry showed that the period of incubation ranged from a fortnight to three weeks. Recovery took place in every case.

[**The Elimination of *Bact. abortus* in the Milk of Cows** Gilman, H. L. *Cornell. Vet.* 1930. April. Vol. 20. No. 2. pp. 106-122. Ex. *Trop. Vet. Bull.* Vol. 18. No. 4.]

The author briefly summarises the earliest literature regarding the presence of abortion bacilli in milk. The part which may possibly be played by the presence of abortion bacilli in the milk in the spread of the disease from cow to cow is not well understood, but it is certainly likely that infection may be spread from one quarter of the udder to another by the hands of the milker. The great majority of calves are free from actual infection at birth, although the bacillus may be in the alimentary canal, and their blood invariably gives a negative reaction to agglutination tests at birth. The subsequent development of a capacity to react on the part of calves from infected cows is "due to direct agglutinin absorption." It is rare for infection to occur in a calf and to persist until sexual maturity. The lymph glands in the throat region may become invaded by the bacillus, but permanent infection rarely occurs. Milk from actively infected udders may have a cellular content up to five times as large as the normal average, and this probably accounts for high cellular counts in milk drawn from apparently healthy udders.

Observations indicate that infection of the udder with abortion bacilli reduces the milk flow, and also that udders so infected are more likely to develop mastitis.

Reference is made to the work done in the United States, from 1911 onwards, regarding the occurrence of agglutinins for *Br. abortus* in the blood of human beings.

The resistance of human beings to infection with *Br. abortus* is by no means completely understood, nor is it known whether certain strains are of definite pathogenic importance.

The author advocates pasteurization as the safest and surest method of eliminating the danger from infection with the abortion bacillus, but he also indicates that by means of the agglutination test of cattle, herds can be, and have been, freed from the disease. The clearing of large numbers of herds of the disease is a process requiring a considerable length of time, but it can be done. He does not think that universal pasteurization is wise or necessary,

but it is essential to the greater part of the milk supply of large cities. It is not feasible in small communities or on farms where, it is admitted, most of the cases occur.

There is much that is still obscure regarding the infection of the udder with abortion bacilli—the actual location of the infection, the intermittent appearance of bacilli in the milk, the relationship between the presence of agglutinins in the milk and the presence of bacilli in the udders, the relationship between the presence of agglutinins in the milk and in the blood. With a view to clearing up some of these points work has been begun in connection with the correlation between the agglutination titre of the milk, and the presence of bacilli in it; the work is not complete but certain facts have been revealed.

The milk was examined from all four quarters of 34 animals, 9 of which were tested twice, giving a total of 43 animals. It was tested by agglutination and by guinea-pig inoculation. The bacillus was not recovered from milk showing agglutinins under 1 in 80, nor from the milk of an animal with a serum titre below 1 in 320. It was recovered from 53·7 per cent. of the milk from quarters showing agglutinins in dilutions of 1 in 80 or higher. It is therefore concluded, tentatively, that whey which will cause agglutination in dilutions of 1 in 80 or higher comes from quarters probably infected actively with the bacillus, while quarters the milk of which causes agglutination in dilutions under 1 in 80, rarely contain or eliminate the organism. The author holds that the presence of agglutinins in the milk is mainly or exclusively an evidence of local production of agglutinins. It has frequently been shown that there is no constant relationship between the agglutinins of the milk and those of the blood.

Value of Good Breeding.

"There must be very few arguments in favour of well-bred livestock that have not been brought forward by one or other of the breed societies," says the Agricultural Correspondent of *The Times*. "One aspect of the subject which seems to have been overlooked is to-day perhaps the one of greatest appeal to the commercial farmer. The high-class animal is a real labour-saver. One good cow yielding as much milk as two or three inferior specimens reduces the cost of attendance in proportion; but this saving is commonly obscured by the attention given to the saving on maintenance rations. Pigs which, being bred for early maturity, attain bacon weight at seven months instead of nine or ten require so much less labour for the production of the finished carcass; but here, again, more stress has been laid on the cheapening of the food costs rather than that of labour. Parallel circumstances hold good in beef and lamb production. A more careful study of labour costs as affecting the profit or loss on animal products would furnish the strongest possible proofs of the economic value of good breeding."

H.M. Stationery Office Publications.

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

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N.V.M.A. Divisional Reports.

North Wales Division.*

Discussion on Veterinary Advisory Work.

The annual meeting of the Division was held at the Imperial Hotel, Rhyl, on Friday, November 21st. The President, Mr. J. H. Wynne, occupied the chair, and the following members were also present:—Messrs. Bate, Broome, Booth, Butler, Cane, Cartwright, Davies, Edwards, H. V. Hughes, T. W. Hughes, W. Hughes, Llewelyn Jones, W. O. Jones, and Lewis, Dr. Montgomerie, Messrs. Roberts, Savage, and Wynne Williams. There were also present Messrs. Evans, Rowlands and Lawson.

The minutes of the previous meeting having been published in the *Veterinary Record*, they were taken as read and were confirmed. Apologies for absence were received from Colonel Brittlebank, Professor Gaiger, Principal Hobday, Messrs. Wynn Lloyd and Mills, and Professor Share Jones.

Obituary.—The President said it was his painful duty, at the outset of the meeting, to remind the members that since the last meeting they had suffered a great loss in the passing of their old colleague, Mr. Richard Jones, Towyn. Mr. Jones had given them an address at their last meeting and they had intended to discuss it at the present meeting, but things had turned out otherwise and he had been called away from them. Mr. Jones was one of the founders of the Society and he attended the meeting at Llangefni 20 years ago. Since then he had been a very regular attender, and that in spite of the long distances which he was obliged to travel to be present. For a great number of years he had been their Treasurer and he had also occupied the position of President and Vice-President. Thus they owed a great debt to Richard Jones. They all respected him as a great surgeon, a valuable colleague and a good friend. The President then asked the members to join in passing a vote of condolence with Mr. Jones' widow and family. The members rose together as a token of respect.

Election of Officers.

The following officers were elected for the ensuing year:—

President.—Mr. J. Cane.

Vice-Presidents.—Messrs. W. H. Savage and R. L. Lewis.

Hon. Treasurer.—Mr. C. W. Cartwright (re-elected).

Hon. Secretary.—Mr. H. V. Hughes (re-elected).

Additional Members of Council.—Messrs. Llewelyn Jones and Booth.

Auditors.—Mr. Broome and Dr. Montgomerie.

Nominations.—The following gentlemen were nominated for Fellowship of the Division:—Messrs. W. F. Hughes and Davies.

Elections.—The following gentlemen, having been already nominated, were unanimously elected Fellows:—Messrs. T. M. Evans, R. M. Lawson, R. Platt, J. C. Rowlands, W. T. Rowlands, and R. Wynne Williams.

* Received on December 19th, 1930.

Correspondence.—1: A letter from the Victoria Veterinary Benevolent Fund acknowledging the receipt of £1 7s. 1d. collected at the July meeting. The collecting box was passed around during the meeting and the resulting collection amounted to £1 4s. 9d.

2. A letter from Dr. Williams, of the Welsh Board of Health, asking the Society to arrange another demonstration of the Intradermal Tuberculin test and suggesting that Mr. Glover should give the demonstration with the assistance of Dr. Montgomerie. It was agreed to hold the demonstration in the Bangor district at the February meeting, if Dr. Montgomerie could make arrangements for a suitable herd.

Veterinary Advisory Work.

3. A letter from Dr. Montgomerie enclosing a circular-letter which had been sent to all the North Wales practitioners by Professor R. G. White, of the University College, Bangor, relating to the extension of veterinary advisory work, was next read.

The President reminded the members that the letter had been deferred from the last meeting and he now invited discussion.

Mr. Edwards said: I take it that this letter invites us, as a Division, to express our approval and offer a welcome to the extension of the Veterinary Advisory Scheme in North Wales, and I feel sure that we would like to take the opportunity of considering the bearing of this advisory work upon the work and interests of the general practitioner; moreover, since the questions involved are now occupying the attention of the National Veterinary Association, the time is very opportune.

I have some criticisms to offer, and I wish to make them of an entirely impersonal character; I want to criticise the advisory scheme, and not the officers who have to work under it—I desire to criticise principles and not persons, and trust this discussion will be continued in that spirit and that sense.

I do not suppose that any of you would suspect me of having any personal axe to grind in this matter, but although I am out of practice, I still remain a veterinary surgeon, with, I trust, the best interests of my profession at heart, and that is the only axe I have to grind to-day. Having been a general practitioner for over 30 years, I think I know something of his difficulties, how increasingly difficult it is to build up a practice, how long it takes to capture the confidence of the farmers and establish one's prestige among them, and also how easily that confidence can be destroyed, and the prestige lost. I am also one of those who believe that the general practitioner is still the backbone of the profession, that he has served the agriculturist admirably in the past, and that if, from any cause or causes, their numbers are depleted or men of inferior calibre take their places, it will be a sorry day for the profession as a whole, and the agriculturists in particular.

You have before you copies of the official schedule issued by the Board of Agriculture for the guidance of advisory officers, entitled "The Duties of Veterinary Advisory Officers."

"(*a*) The work of a veterinary advisory officer is (i) to advise farmers in his province on matters relating to diseases which are not ordinarily treated by veterinary practitioners: and (ii) to investigate problems concerning diseases of local importance and to co-operate in the investigation of such diseases.

"(*b*) A veterinary advisory officer will naturally endeavour to obtain the goodwill and confidence of farmers in the province. He should also make the acquaintance of the agricultural staffs and the veterinary practitioners in the province and work in co-operation with them.

"(*c*) Advice may be given in many ways—by means of correspondence, visits to farms, conferences with bodies of farmers, occasionally by publications and articles in the local press; there is no reason why advice should not include information as to simple treatment provided that the general work of the practitioner is not interfered with.

"(*d*) The nature of the investigations undertaken will be determined from observations made in the course of advisory work, and from the result of surveys. It is not to be expected that, in most cases, a veterinary advisory officer will be able to undertake single-handed an exhaustive investigation into any disease. Research institutes exist for such investigations and a veterinary advisory officer may expect their assistance and should in turn be prepared to co-operate in joint schemes of research arranged by the Animal Diseases Committee of the Agricultural Research Council.

"(*e*) The results of an investigation into a local problem may well be communicated to the veterinary profession through recognised periodicals and also published in a form readily available to farmers in the locality. As a matter of courtesy, local veterinary practitioners should be informed of any intention to publish information in a non-technical form. Efforts should be made to put continuously before farmers and veterinary practitioners not only the results of investigations of this kind, but also of other pieces of research likely to be of value to them: in cases where the information is of general interest, it may be issued as a leaflet by the Ministry of Agriculture, and the Ministry will welcome suggestions for this purpose.

"(*f*) A veterinary advisory officer should not deal with matters which are ordinarily referred to local veterinary surgeons and should not act as consultant in individual cases of ordinary illness in stock.

"(*g*) Veterinary advisory officers should not engage in quasi-commercial work such as the preparation of vaccines for sale; but where veterinary practitioners in the area are unable to cope with pressing remedial measures on a large scale (*e.g.*, the inoculation for braxy in certain areas) it is legitimate to distribute vaccines or other specifics and to instruct farmers in methods of application.

"(*h*) In making grants in aid of advisory work, the Ministry expressly recognises that the University or College acting as the Provincial Centre may call upon advisers to undertake a certain amount of lecturing to students; in the case of veterinary advisory officers, the time devoted to such lecturing should be restricted to a minimum. In no case may advisory officers lecture on more than two days a week during term time."

I think (proceeded Mr. Edwards) that this schedule will be quite new to most of you, but I trust you will all give it very careful study, and feel sure you will then agree with my opinion when I say that it is an extraordinary document. I venture to think that if this "List of Duties" had been before the profession when the advisory scheme came into being, the profession as a whole would have refused all co-operation with the scheme.

But this schedule was not the original one; it has been greatly altered since, and I doubt if the original one either was known to, or ever seen by, the vast majority of practitioners. My criticisms are based entirely upon this "List of Duties" and the policy pursued by advisory officers in carrying them out. That criticism of the actions of the officers is inevitable, but it is made in no personal sense—the advisory officer has my sympathy to a certain extent, as the victim of a meddlesome system.

May I ask you now to consider paragraph (1) of clause (*a*): "The work of an advisory officers is:—

(1) To advise farmers in his province on matters relating to diseases which are not ordinarily treated by veterinary practitioners:" Now, I should like to ask (1) Who compiles this list of diseases; is the general practitioner consulted, or are the advisory officers and the Ministry of Agriculture the sole arbiters and compilers?

(2) What are the diseases on this list? The Ministry of Agriculture must surely have had in mind a lengthy list of diseases, and those of great economic importance to the agriculturists of this country, if they were to justify the creation of a new staff of official veterinary surgeons in various centres to deal with them.

I invite you all, and also veterinary advisory officers, to give us a detailed list of the "diseases not ordinarily treated by general practitioners," so that we may all see whether they agree, and we may know where the list is going to stop.

In asking you to compile a list, may I start it with one, namely, "Fluke" in sheep. We all know that in the past this was a disease upon which the farmer did not consult anyone, because no one could give him much advice of value, except perhaps in the direction of prevention.

We know also that in recent years, owing to researches in this country and abroad, new knowledge has been acquired, remedies and a successful treatment have been discovered, and let me say here that very valuable and distinguished work was done by Dr. Montgomerie at the Bangor centre in connection with the breeds of sheep in Wales.

Now, in the ordinary or normal course of things, this new knowledge would have been passed from the research worker to the practitioner, and by him to the farmer, who would now call him in, and in consequence some little grist would have gone, and legitimately gone, to his mill. What did happen in North Wales was very different. The new knowledge was passed on by advisory officers direct to the farmers by means of pamphlets, organised lectures, and press articles. The farmer was told not only the history and cause of the disease, but also the symptoms and how to diagnose it, the names of the drugs used in treatment, the doses required for differing ages and weight of sheep, the special capsular form in which the remedies could be obtained, and that these could be purchased at any drug store, at so much per dose.

After that, need we wonder that "Fluke" in sheep can still stand at the top of the list of those "diseases not ordinarily treated by general practitioners"?

Now I would ask, dare any of you general practitioners do any of these things? May I put it this way—suppose that one of you, one of these days, makes an epoch-making discovery, such as that of Herr Schmidt—whose memory we delight to honour—in mammary inflation for milk fever.

I do not for a moment suppose you would desire to do so but, I would ask, *dare* you communicate your discovery by lectures, pamphlets or press articles, either to your own clientele, or that of other practitioners all over the countryside? I think that your own sense of dignity and of that of your profession would have deterred you, and if it did not, that you would have been called before the disciplinary authority of your profession to answer a grave charge of breach of professional conduct.

Let us now pass to paragraph (ii) of clause (*a*). "To investigate problems concerning diseases of local importance and to co-operate in the investigation of such diseases."

At first sight it would appear as though co-operative work between the general practitioner and the advisory officer were intended here, and if that were the whole scope, and a strict liaison between the two were established, the advisory scheme could prove of great value to the profession and the agriculturist. If you will, in this connection, read clause (*d*), you will, however, see that serious exhaustive research is not expected from an advisory officer—"Research institutes exist for such investigations," says this clause.

Nevertheless, we know that valuable help is given to practitioners in solving local problems, and, if one dare offer a word of constructive criticism to such an august body as the Ministry of Agriculture, it would be that if the advisory scheme were so framed as to constitute a link of field research as between the general practitioner as the provider of clinical and other material, then the advisory scheme would be a boon. But, mark this, the advisory officer is not, in this clause, restricted to "co-operation" with the general practitioners—they are not mentioned at all.

On the other hand, we know, and it is not denied, that the advisory officer goes direct to, and is called in direct by, the farmer, quite independently or the general practitioner, who indeed, may know nothing of the matter. That is what happens, and I ask you to ponder over it and ask where it is to end.

We now come to clause (*c*): "Advice may be given in many ways—by means of correspondence, visits to farms, conferences with bodies of farmers, occasionally by publications and articles in the local press; there is no reason why advice should not include information as to simple treatment provided that the general work of the practitioner is not interfered with."

Taking this clause as a whole, it seems to me that there is a breach of professional etiquette in every line of it.

Again, I would ask, dare any of you general practitioners do any of these things? Dare you enter into correspondence and give advice on the diseases of animals outside your own clientele, visit their farms, hold conferences with bodies of farmers and give lectures to them, or write articles to the lay press?

If for you, as a general practitioner, to do these things would be a breach of etiquette, why is it not so also with an advisory officer?

Can an M.R.C.V.S., by becoming appointed an advisory officer, contract out of the ethical laws which govern your conduct and do so with impunity, and is he protected by the Ministry of Agriculture and the shadow of a University—in short, is there one code for a general practitioner and another, in violent contrast with it, for the advisory officer? I am not blaming the advisory officer as an individual—he is compelled to obey his orders—but I maintain that no veterinary surgeon can carry out the duties prescribed in this clause and remain loyal to the written and unwritten code of the profession to which he belongs.

It may always be difficult to bring home a case of "direct interference" with the interests of an individual general practitioner, but I consider that under this clause,

and in the instance detailed under clause (*a*), we have *wholesale* material interference of a serious character. This clause brings us, indeed, to the crux of the whole matter; either it is wrong to do these things or it is permissible to do them, and I think it is highly desirable that we should have an authoritative ruling from the Royal College of Veterinary Surgeons.

I ask you to say that they are gravely unprofessional, and that as the "List of Duties" stands, and is carried out, the advisory scheme constitutes a serious menace to the prestige and public standing of the profession as a whole, and is directly harmful to the material interests and the prestige of the general practitioner. I must not detain you much longer, and will only ask you to give your attention now to clause (*g*)—and these words: "but where veterinary practitioners in the area are unable to cope with pressing remedial measures on a large scale—it is legitimate to distribute vaccines or other specifics, and to instruct farmers in methods of application."

There is here no courteous intimation that the call for help is left in the hands of the "veterinary practitioners in the area" concerned. On the contrary, the practitioner is apparently not to be the judge as to whether he can cope with his own work or not, but the advisory officer is to be the arbiter, and it is to be "legitimate" for him to place the work in the hands of farmers—could discourtesy, and "interference with the work of the general practitioner" go further? I hardly think the Ministry of Agriculture realises how many hours a practitioner can and does work when there is work to do—he does not ask for a seven-hour day—and at any rate he should surely be allowed to send out his own s.o.s. for help, and when it is required it should be professional help only. This wide and loose clause indicates no limits to such panic measures, it is a case of "employing unqualified assistants" with a vengeance, and is a direct interference with the material interests of the general practitioner, as well as breaking the fundamental code of his profession. I pointed out that the subject of the advisory scheme has been for some time engaging the attention of the "National" Association, and I have permission to read here a copy of a letter addressed by that body to the Ministry of Agriculture.

The Duties of Veterinary Advisory Officers.

Sir,—The National Veterinary Medical Association of Great Britain and Ireland has recently felt impelled, in the interests of the veterinary profession and of stock-owners, to give careful consideration to the duties of veterinary advisory officers as laid down by the Ministry of Agriculture and Fisheries in the attached memorandum, and I have been instructed to place the views of this Association before you and to ask that they be submitted to the Minister of Agriculture.

In view of the depressed state of agriculture, this Association recognises the desire to give free advice to farmers and stock-owners, but it would like to point out that this very fact is also affecting seriously the general practitioner, who himself depends on agriculture, and if these posts are multiplied it will be impossible for him to maintain a practice in many country districts, especially as work under the Diseases of Animals Acts and the Milk and Dairies Act is being gradually handed over to county veterinary officers. If country districts are depleted of their veterinary surgeons it will be a very serious matter for the stock-owner, and there is already evidence of this taking place.

The stock-owner assumes that the veterinary advisory officers have knowledge or skill superior to that of the practitioner, which places the practitioner in a very invidious position with his clients—a position which is becoming deeply felt and strongly resented in many parts of the country. Investigation of animal diseases requires special training and long experience and unless the advisory officer is attached to some veterinary research institute or school he is very seriously handicapped as he has not the opportunity of team work and advice which are so essential.

Country veterinary surgeons are well qualified by their intimate experience of the ailments and management of farm animals to advise and to co-operate clinically with pathologists, research workers and other experts in the investigation of problems concerning animal diseases of local or general importance, and they are just as capable as the advisory officers of transmitting the more recent scientific discoveries from the research institutes to the farmer.

As advice on matters relating to animal diseases has always been freely given by veterinary research institutes, by the veterinary schools, by veterinary inspectors, and by the Diseases of Animals Division of the Ministry of Agriculture, this Association is quite unable to appreciate the motive for the appointment of these veterinary advisory officers.

As much of the proposed work of veterinary advisory officers is being done in various districts by members of the staff of the Ministry of Agriculture, augmentation of this staff would be infinitely preferable to making further appointments of advisory officers.

In conclusion, I am instructed to add that if agreeable to the Minister of Agriculture, this Association would beg the favour of his receiving a small deputation at an early date.

I am, Sir,
Your obedient Servant,
(signed) George P. Male,
President.

The Secretary,
Ministry of Agriculture and Fisheries.
10 Whitehall Place,
S.W.1.

Many forces, as this letter indicates, are at work to-day which are reacting severely upon the position of the practitioner. He is being told, not in words but in much more potent ways, that he is unfit to carry out the work arising from the administration of those Acts concerned with the public health and the control of animal health. Most of the work under the Diseases of Animals Act has gone long ago, that arising under the tuberculosis and the Milk and Dairies Orders is being handed over to whole-time officers, the position of the profession is far from satisfactory in relation to the inspection of meat for human consumption and, finally, in the advisory scheme, we have, to my mind, an arbitrary invasion of the field of clinical work, the limits of which are unknown, and its methods unfair, not to say unscrupulous.

There have never been many "plums," but plenty of hard work, in a general practice, and in the currents of policy which are now flowing around us we see the rapid creation of a bureaucracy in our profession, the cumulative effects of which will be to reduce the position of the general practitioner to a mere "hewer of wood and drawer of water." If the erosive process goes on, the inevitable result will be the depletion of the ranks and deterioration in the personnel of the general practitioner, and that will be disastrous to the profession and to the agriculturalist in the long run. The general practitioner has occupied an honourable position as a scientific servant of the public, and his training, experience and clinical knowledge entitle him to retain and to extend it.

I would ask you, if you agree with the views I have expressed, to give your support to the "National" Association in the measures it is taking on this matter.

Mr. Llewelyn Jones, continuing the discussion, said he had supported the advisory scheme and the advisory officer, but he thought that the officers should always work through the general practitioner and avoid dealing directly with the farmer.

Mr. Wynne Williams spoke of his experiences during the last severe outbreak of liver rot, when he had used "Danistol," a remedy which was sold only to the members of the profession. He considered that extract of male shield fern should be used only under the guidance of veterinary surgeons, and he emphasised the necessity of the advisory officer advising the agriculturalist only through the veterinary surgeon.

Mr. Booth thought the difficulties which had arisen in North Wales were due to the advisory officer advising methods of treatment, as he had done in the case of liver rot. This he considered was no part of an advisor's duties. It should be left to the practitioner.

Mr. Cane said he agreed with what Mr. Edwards had said and expressed concern for the future of the country practitioner if the scheme was to be continued as it had been.

Mr. W. Hughes also expressed himself as being opposed to any extension of the advisory scheme, and said he agreed with what Mr. Edwards had said with regard to the damaging effects it was having upon private practice. As things went on there would, he thought, soon be no work for the general practitioner, for it was all being taken from him.

Mr. Savage spoke of his associations with the advisory officer. The relationship between them had always been most amicable. In his opinion the work of the officer had been of service to him rather than of detriment to him, and he felt indebted to Dr. Montgomerie for what he had accomplished at Bangor.

Mr. Roberts also spoke of the services which the advisor had rendered to him in different ways. He thought Dr. Montgomerie deserved their sympathy, for he was in a very difficult position; although a veterinary surgeon, he was attached to an agricultural college whose work was to advise farmers in different ways and he would, no doubt, be encouraged to publish information which would benefit the agriculturist.

Mr. Lawson said he wished to endorse all that Mr. Edwards had said. He had had bitter experience of the advisory scheme. He had lost financially through it, but, what was of more importance, he had also lost prestige. He considered that if the agricultural community were to make full use of the services of the profession at present available the advisory officers would prove superfluous.

Mr. Lewis expressed himself in agreement with what Mr. Edwards had said.

Mr. Evans also spoke against the scheme. He cited an instance of what he considered to be interference by the advisory officer and stated that he had undoubtedly lost prestige through the working of the scheme in his area.

Mr. Bate said he had no personal experience of the scheme in his practice, but he thought the Division ought to support the Council of the "National" Association in their endeavours to protect the rights of the practitioner.

Mr. H. V. Hughes observed that he was reminded that, in 1925, he had written to the *Veterinary Record* to protest against the way the scheme was being carried out in North Wales, and how he had been criticised by some of the practitioners. His reply to his critics had unfortunately been refused publication by the Editorial Committee of that time, but he was glad of the opportunity of saying that he had a reply to offer them, and he felt, after hearing the discussion that afternoon, that the members were now coming to see that he was right at the time. He remained utterly opposed to the advisory scheme, and considered it wrong that it should have been instituted in a profession such as theirs. He wondered what the members of the medical profession would have done had such a scheme been suggested to them.

Dr. Montgomerie said he was pleased that the members had discussed the scheme in such a frank way and he appreciated how clearly the majority of the speakers had made plain the fact that they were not attacking him or his work in particular, but were dealing with the scheme as a whole. He thanked Mr. Jones Roberts for his emphasis of the difficulties which beset the advisor in the carrying out of his duties and could say that, throughout his activities in North Wales, he had very genuinely tried to avoid causing friction or giving rise to cause for complaint. (Hear, hear.) One of his major difficulties in that respect was the different attitude adopted by the various practitioners. Some had given him a perfectly free hand in their practice and only expected to be kept in touch with his activities among their clients. Others did not even co-operate to the extent of taking the trouble to reply to his letters, so that he did not know what line they would have him take in any enquiry or investigation.

He had not referred to this list of duties which Mr. Edwards had criticised, since it was circulated some years ago, because he had adhered to a procedure which was well within that laid down. He thought it best that he confined his remarks to specific matters. The complaints of breach of professional etiquette which time and again had been made against the delivery of lectures, the writing of leaflets, etc., formed the most serious aspect of the discussion from his personal point of view. He was particularly anxious to know exactly where he stood in these matters, and he thought it the duty of those who believed some breach had been committed to report the matter to the R.C.V.S. He asked why that was not done, and pleaded to have this point definitely decided.

Complaint had been made with regard to the publication of the liver rot investigations. He believed that he was in duty bound to publish the result of his work and it was no fault of his that capsules were being sold by country chemists and others. The question of the publication of results was a major issue.

Mr. Wynne Williams had said that the advisor had worked for a particular firm of wholesale chemists, but that certainly was not true. In regard to the statement that "Danistol" was supplied only through veterinary practitioners, he must point out this proprietary preparation was sold to the farmer direct and through various agents. Mr. Williams's complaint regarding the use of lamb dysentery serum was not at all clear, but Dr. Montgomerie had understood that all the practitioners concerned agreed that the present mode of procedure was the only practical one. With regard to Mr. Evans' specific complaint, Dr. Montgomerie, having had Mr. Evans' name the farm involved, said he believed that Mr. Evans was mistaken and he would look into the matter immediately.

It had been suggested that the practitioners should cease to support the advisory scheme. If this did occur a very difficult position would arise, since the only channel of communication would be the direct one. He had made particular effort to avoid friction, and he fully realised the great difficulties and dangers which beset him in his work.

The President then asked Mr. Edwards if he wished to reply to the discussion.

Mr. Edwards observed that he had very little to add to what he had already said. He was pleased that the discussion had been of such an impersonal nature and yet had been so frank. He expressed his sympathy with the advisory officer in the unenviable position in which he was placed, but he thought it wrong that a member of the Royal College of Veterinary Surgeons should be obliged to work under such conditions. He remained convinced that the advisory scheme was damaging to the interests of the profession and he therefore asked the members to support the following resolution: "That the members of the North Wales Division of the National Veterinary Medical Association of Great Britain and Ireland, assembled in general meeting, endorse in its entirety the terms of the letter addressed by the 'National' Association to the Ministry of Agriculture on July 23rd last on the subject of the duties of advisory officers, and assure the 'National' Association of the full support of the Division in any measure it may take to secure the drastic modification of the present advisory scheme, or, failing that, its discontinuance. This Division is of opinion that the working of the advisory scheme is doing great harm to the position and work of the general veterinary practitioner and also considers that the duties prescribed for, and enjoined upon, the advisory officers cannot be carried out without breaking the rules of professional etiquette governing all members of the Royal College of Veterinary Surgeons." Mr. W. Hughes seconded the resolution, which was carried *nem. con.* It was also agreed that the Secretary be advised by the Committee of the N.V.M.A. dealing with the question as to whom to send copies of the resolution and as to the reporting of the discussion in the *Veterinary Record.*

The next item on the Agenda was a paper by Mr. Hughes, Caerwys, on "Some Interesting Equine Cases," but the President, after thanking Mr. Hughes for having prepared the paper, asked him if he would consent to read it at a later meeting as the time had gone. Mr. Hughes said he was quite willing to give his paper later.

N.V.M.A. Membership.—A letter from the Council of the N.V.M.A. was read in which it was suggested that a small committee of the Division be appointed with a view to encouraging members of the profession who were not already members of the N.V.M.A. to join that body. It was agreed that the President and the two Vice-Presidents form the committee.

Hon. Treasurer's Report.—The Hon. Treasurer then presented his annual report. This showed a credit balance of £27 12s. 7d. Mr. Cartwright said he would be glad to receive any subscriptions outstanding.

Council.—The Secretary reported that the Council had met only twice during the year to consider the sheep scab memorandum from the Royal Agricultural Society (on which a report had been presented to the Division) and to authorise payments by the Treasurer.

International Veterinary Congress.—The President reported that he had attended the International Veterinary Congress as representing the Division. Mr. Wynne gave a brief account of his experiences and expressed his pleasure at having been enabled to enjoy such a valuable experience. The Hon. Secretary also spoke of the pleasure he had derived from the Congress and tendered his thanks for the honour of being appointed a representative of the Division.

Vote of Thanks to the Retiring President.—Before the meeting terminated, Mr. Cane rose to propose a vote of thanks to the retiring President, Mr. Wynne, for his work for the Society during the year. Mr. Wynne had been an excellent President, and he had acted in a very kind way in the chair. He felt that he would have a difficult time in endeavouring to maintain the high standard set by his predecessors in the chair—he would feel much more confident in the cricket field—but he would do his best to fulfil his duties successfully. The vote was carried with acclamation and in a brief speech Mr. Wynne thanked the members for their kind appreciation of his efforts during the year. He assured them that it had been a pleasure for him to act as their President.

Howel V. Hughes, *Hon. Secretary.*

Veterinary Medical Association of Ireland.*

Discussion on "The Eradication of Bovine Tuberculosis."

A General Meeting of the Veterinary Medical Association of Ireland was held in the Veterinary College, Dublin, on Friday, November 28th, at 7.30 p.m.

The following members and visitors were present:—Professor J. F. Craig (President); Messrs. F. J. Daly, L. M. Magee, R. H. Lambert, P. J. Howard, A. F. O'Dea, E. W. Little, P. J. Gaffney, J. Morris, S. O'Donovan, P. A. Rogan, T. O'Leary, T. J. O'Meara, P. McGlinchy, W. McCaughan, J. Campbell, J. F. Moran, C. O'Driscoll, C. P. Hynes, M. McClancy, J. Doyle, C. W. Griffin, S. Conway, J. E. Kenny, R. M. McManus, F. W. Taylor, H. O'Leary, and Professors Browne, Kearney, and O'Connor (Hon. Secretary).

The minutes of the previous meeting, which had been circulated amongst the members, were taken as read and confirmed.

Correspondence.

(1) From Sir John Moore and Messrs. Creagh, Brown, Power, Condon, Healy and O'Brien, expressing regret at inability to attend.

(2) From Mr. Alexander, referring to a resolution of the Waterford County Council regarding an annual holiday for veterinary officers and payment of substitutes, which had been refused by the Department. He would be glad to know if the Association would move in the matter, as he was arranging for a meeting of the Waterford Association shortly. (The Hon. Secretary stated that he had written to the Department requesting them to grant

* Received on January 2nd.

these concessions and had received an acknowledgment stating that the matter would be considered.)

(3) From Mr. Flanagan, Ballinasloe, enclosing a copy of the *Connaught Sentinel*, containing an account of proceedings instituted for loss sustained by a farmer whose horse died after treatment by a "quack." The farmer had been awarded damages and further proceedings were pending for false description as a veterinary surgeon.

(4) From the Private Secretary to the Minister for Agriculture acknowledging the Hon. Secretary's letter of October 10th, which would be laid before the Minister on his return.

(5) From the Local Government Department, replying to the Hon. Secretary's letter of October 10th, and forwarding two copies of the Public Health (Veterinary Inspection) Order, 1929.

(6) From the Secretary of the N.V.M.A., intimating that divisional representation on the Council will in future be "The Hon. Secretary (if any) and one representative for every 35 members or portion thereof."

(7) From the Organising Committee of the N.V.M.A., enclosing particulars of recent instances in which the Association had rendered services of value.

(8) From the Secretary, N.V.M.A., acknowledging a letter from the Hon. Secretary of the Society in regard to veterinary officers employed by the Department of Agriculture, and enclosing a copy of a letter on the subject, which had been addressed to the Minister, stating that the terms and conditions of service on which the officers in question were employed were very unsatisfactory, having regard to their duties and responsibilities. The salaries were lower than those paid to officers holding corresponding positions under the British Ministry of Agriculture. It was the opinion of his Association that not only should the pay and conditions of service of the present holders of appointments be materially improved, but greater inducements should be offered to new entrants. The proposals which the Irish Branch had placed before them had the full support of the Association.

(9) From the Secretary, N.V.M.A., referring to the acknowledgment which he had received of the above-mentioned letter.

(10) From the Private Secretary to the Minister for Agriculture, acknowledging a communication of 30th ult., transmitting the resolution adopted at the Association's meeting on July 30th last, and stating that the matter would receive the attention of the Minister on his return.

. . . . .

"The Eradication of Bovine Tuberculosis."

The next business on the agenda concerned the question of the eradication of bovine tuberculosis, and the discussion was opened by Mr. P. F. Dolan, chief veterinary inspector, Dublin Corporation.

Mr. Dolan: I am glad to get the opportunity to take part in the discussion on this subject—the Eradication of Bovine Tuberculosis—and I hope that we will agree to forward to the proper quarter, that is the Government, a suitable statement pointing out the high incidence of this disease and the danger to the public and the loss to traders and agriculturists, and that it is advisable to take steps towards complete eradication, also that a copy be forwarded to the Press.

First of all, we must get outside side interests and make a survey and find out if it is necessary to eliminate this disease; then, if we come to the conclusion that it is necessary, to suggest the best measures to adopt to carry out this aim.

The eradication of tuberculosis is essential on two grounds: (1) public health; (2) for agricultural reasons.

As regards the public health aspect of this question, I give you a post card which illustrates to some extent the damage caused to the human subject by bovine tuberculosis. Naturally, the question arises, is the subject of this post card true or is it untrue? It is clear from the medical profession and from experimental work that tuberculosis is conveyed from bovines to men and is universally accepted, and it is still more clear, especially from the work of Dr. Stanley Griffith, that milk is the important medium. Therefore, the subject of this post card is true and without any exaggeration. The members of the veterinary profession must take their share of blame in allowing this state of affairs to exist in the past and to continue, because they have not voiced their opinions enough and possibly they are more to blame than the ordinary public, as they cannot claim ignorance of the subject.

As regards the agricultural interests, it is clear that if this country were free or comparatively free from bovine tuberculosis it would be an immense benefit to the agricultural community. It must be remembered that this is an exporting country and one of the chief exports is the bovine, or produce from the bovine, and competition is so keen nowadays that it is essential that everything we export is of the best. At the moment we have no real competitor in our live cattle export, but one never knows how things may change.

It is only those who are accustomed to carry out meat inspection who really realise the extent to which tuberculosis has affected our cattle, and the large amount of loss that occurs to traders from this disease. The butcher finds himself in a most unenviable position, in that he goes to the market and buys the best animal at the highest price and still that animal on slaughter may be so extensively affected with tuberculosis that it is totally unfit for food. As regards the loss to the farmer or to the producer, it is in most cases not recognised. It is only in the event of a "waster" or a "piner," that the farmer or producer sees tuberculosis and he cannot visualise that the animal that is fat and looks healthy can be affected with any disease.

In addition, large numbers of our pigs are totally or partially condemned on account of tuberculosis and a large number of these cases are due to the bovine tubercle bacillus.

The following is the average percentage of cattle found affected with tuberculosis on *post-mortem* examination at the Dublin Corporation Abattoir for the past five years:—

Out of a kill of	27,179	cows	7,857	affected	= 28·9%
,, ,, ,,	13,890	heifers	740	,,	= 5·3%
,, ,, ,,	17,451	bullocks	1,240	,,	= 7·1%
Total cattle	58,520		9,837	affected	= 16·8%

For the past 16 months (July 1st, 1929, to November 1st, 1930) out of a kill of 73,033 pigs, 8,586 were found on *post-mortem* examination to be affected with tuberculosis =11·8%.

Another reason why tuberculosis should be eradicated in the interests of agriculture is that the consumption of raw milk in this country would be very nearly double if the consumer had a guarantee that it was free from tubercle bacilli, and moreover, raw milk would be consumed in place of the present dried milks and prepared foods, so much of which are sold at very high prices.

What has been done, and what is being done, to eliminate this disease? In 1913 the Tuberculosis (Ireland) Order was issued and was replaced by the Tuberculosis (Ireland) Order of 1914 which was suspended during the war. This latter Order was again enforced in 1919 and until it was replaced by the Bovine Tuberculosis Order of 1926. The Order of 1926 is not an advancement on the Order of 1914 as regards the types of tuberculous animals to be slaughtered. Under the present Order it is intended to eliminate by slaughter only cattle affected in certain ways—cows affected with tuberculosis of the udder; cows giving tuberculous milk; bovine animals suffering from tuberculous emaciation, and bovine animals showing definite clinical symptoms of tuberculosis with chronic cough. The Order aims at getting rid of those bovines that are the greatest danger to other animals and to public health.

In the main this Order is an excellent one, as the first step in the work of eradication, but it is no great advancement on the Order of 1914; that is, after a lapse of 12 years we have no material improvement in legislation. I must say that the Bovine Tuberculosis Order of 1926 is a very effective method of dealing with a cow affected with tuberculosis of the udder or giving tuberculous milk, but I would like to emphasise that the cow must first be found and the condition diagnosed. Undoubtedly the main advantage of the Order is in the interests of public health, and I am of the opinion that the English Order was enforced to keep the public quiet and the Free State authorities followed.

The present Bovine Tuberculosis Order will never eradicate bovine tuberculosis; in fact, will never make any appreciable difference in the incidence of the disease, and this is borne out by routine meat inspection, the results of which show that animals extensively affected with tuberculosis may show no evidence of the disease during life.

The following are the results of the *post-mortem* examination on 9,837 tuberculous animals for the past five years. Classification is made according to the condition of the animals.

	V. Good.	Good.	Fair.	Poor.	Wasted.	Total.
Total cattle	961	4,566	3,621	602	87	9,837

	Condemned.			
Condition.	Wholly.	Partially.	Organs only.	Total.
V. Good ...	95 ...	115 ...	751 ...	961
Good	411 ...	397 ...	3,758 ...	4,566
Fair	607 ...	596 ...	2,418 ...	3,621
Poor	211 ...	46 ...	345 ...	602
Wasted... ...	86 ...	— ...	1 ...	87
Totals ...	1,410 ...	1,154 ...	7,273 ...	9,837

These figures clearly show the large number of animals in good condition and outside the scope of the Bovine Tuberculosis Order of 1926 that are affected with tuberculosis and some so extensively affected as to cause condemnation of the whole carcass.

In the past it is quite evident that we have been following the lead given by England in this question, and our legislation has been much the same, but it is quite a different matter here from that in England, chiefly because we are an exporting country and England imports most of our exports.

As to the cause of insufficient action being taken in this important question of bovine tuberculosis—there are two main reasons; the first is that important individuals, including some medical men and some interested parties, state that bovine tuberculosis causes protection to the human subject from human infection. To my mind this is complete adult selfishness and acts as a salve to the conscience of a number of people. Assuming that this statement is true, can one remain satisfied that many hundreds of children should die each year and many thousands be permanently injured, so that a doubtful amount of immunity be given to the rest of the community? In this connection I quote you a paragraph from a paper prepared by Dr. Stanley Griffith for the National Meat Conference in 1922:—

> "This I consider a dangerous doctrine, because even a small dose of bovine tubercle bacilli may set up fatal tuberculosis in a child, and it is certain that in the present conditions of the milk supply in Great Britain the bovine tubercle bacillus causes a considerable amount of preventable disease and loss of life."

Some years ago I was an interested listener at a lecture given by Sir Robert Jones on the necessity for the prevention of cripples, and one statement he made in connection with tuberculosis in the milk supply to children is worth repeating: "It is better to have a paling at the top of a cliff than an ambulance at the bottom."

The second main reason is the apathy of the public, or I should say selfishness. It has been shown that children are the chief victims of bovine tuberculosis and I am quite satisfied that if it were adults then serious action would have been taken, long ago, to eliminate this disease.

As regards the loss to the farmer or producer, I doubt if he has felt this loss, because he has passed it on to other shoulders, such as those of the butcher. I believe that if the farmer or producer had to bear his share of the loss occasioned by bovine tuberculosis, then we might hope for some serious action to be taken.

Concerning the other causes for the delay in eradication—that is the nature of the disease, the cost to the State, the immensity of the problem—these can all be effectively dealt with if the public demands eradication.

What is the best means to eliminate this disease? It is quite clear that, due to several reasons, especially the large number of animals affected, the elimination must be by degrees, and it should be distinctly understood that it is not intended to advise wholesale slaughter of all affected animals within a short period. Some people point out the serious decrease in the milk supply that would result and unfairly use it as an argument against eradication. A serious attempt should be made at once in the preliminary work and the incidence of the disease decreased year by year, and in the near future the complete eradication may be attempted.

Educational work on a general knowledge of the cause and nature of the disease is essential and, in addition, tubercle-free herds should be established throughout the country and the first step in "area" eradication should be taken. So that the steps to be taken are: (1) Widening the scope of the Bovine Tuberculosis Order; (2) Educational work; (3) Tubercle-free herds; (4) Area eradication. There is no necessity to say any more about the Tuberculosis Order. The necessity for the educational work is apparent when we recognise that the co-operation of the farmer is essential. I see no reason why "area eradication" on a small scale should be delayed, especially as certain parts of this country are quite suitable for this method. A certain suitable area is selected, all the bovines are tuberculin tested and the reactors are removed, and after certain intervals re-testing is carried out and reactors removed. In this way the whole area can be made tubercle-free provided efficient disinfection is carried out and that bovines are prevented from entering the area except under strict supervision. In addition, it is necessary to prevent the entrance of infection through such channels as affected pigs. As the result of area eradication the movement of the cattle is outwards and there should be no necessity to bring in cattle from outside sources except under special circumstances, such as the purchase of bulls. The setting up and maintenance of tubercle-free herds with success by a sufficient number depends to a large extent on the facilities for the purchase of guaranteed tubercle-free animals, and on this account area eradication is THE important item. Tubercle-free herds set up by wealthy or independent individuals alone will never make any headway in eradication work; it is absolutely essential that the ordinary farmer, particularly the enterprising dairy farmer, should be in a position to have a tubercle-free herd. Tubercle-free herds, of course, must be "self-contained" herds, and to achieve success it is necessary that they should be rigidly "self-contained." The main principles are: (1) Rearing selected heifer calves to replace wastage; (2) A bull must be kept on the farm and no bovines allowed on the farm; (3) The prevention of infection by contaminated food stuffs, or animals in adjoining farms breaking in through bad fences; or pigs affected with tuberculosis; (4) In different herds there may be special difficulties and obstacles such as infection from avian and human sources. I am of the opinion that a tubercle-free herd must necessarily be abortion free, or at any rate steps should be taken to make it abortion free.

The Corporation of Dublin have set up one in recent years and the herd now comprises 50 cows, 12 calves and one bull. The animals are tubercle-free and abortion free. The maintenance of this herd disease free is not an easy matter and causes a considerable amount of anxiety.

The first animals were purchased in October, 1926, and in all amounted to 82 cattle.

It is worth noting that, as I believe, success would not have been achieved in the time but for the fact that a large number of heifers was purchased and, in addition, a large number came from Kerry.

There are a lot of worries and a lot of obstacles in connection with the process of establishing a tubercle-free herd, but I feel that there is not time to go further into the matter to-night.

With reference to the diagnosis of animals that come within the scope of the Bovine Tuberculosis Order of 1926, one depends to a large extent on the microscopic examination of material; save in comparatively rare cases one would not like definitely to say that an udder in the live animal was tuberculous without the aid of a microscopic examination, but there are certain indications which make the udder suspicious. When an induration is present and it is painless, without heat, and the milk is normal or fairly normal in appearance, or in advanced cases or dry cows, watery in appearance (that is, that it is not flocculent) then one has every reason to suspect tuberculosis. The examination of the supramammary lymphatic gland is of little service save that in most cases where this gland is found to be enlarged the disease is more often due to cocci rather than tubercle bacilli, and in many cases of tuberculosis of the udder the supramammary lymphatic gland is not affected.

The following are the results of the *post-mortems* on 27,179 cows for the past five years, with special reference to tuberculosis of the udder:—

No. of cows slaughtered		27,179
No. of cows affected with tuberculosis		7,857
No. of cows affected with tuberculosis of the udder		238
Percentage of cows affected with tuberculosis of the udder		·88%
Percentage of tuberculous cows affected with tuberculosis of the udder		3%
No. of cows in which the udder was affected ...		238
Supramammary gland affected	116	
Supramammary not affected	122	
No. of cases in which the supramammary lymph. gland was affected		227
Udder affected	116	
Udder not affected	111	

The following is the procedure adopted by the Dublin Corporation in connection with the inspection of dairy cows—The Veterinary Inspector takes samples from suspected udders and brings them in to the Laboratory and subjects them to a microscopic examination. Years ago I fully recognised the importance of the fact that the Veterinary Inspector who takes the sample of milk should also carry out the microscopic examination, and this procedure is still carried out in the City. Of course it may not be suitable or it may not be possible in all areas. Microscopic examination of milk for tubercle bacilli is a tedious process and it will be found that the person taking the samples of milk, that is the person who examines and understands the cow, will take more interest in microscopic examination, and will get better results.

In the course of examination of dairy cows a large number will be found to have abnormal conditions of the udder which may not be suspicious of tuberculosis, but still one is not quite free from doubt. In these cases a microscopic examination is made or the samples are grouped together at the discretion of the Veterinary Inspector and subjected to animal inoculation. In this way it is almost impossible for a cow with tuberculosis of the udder to escape veterinary examination.

In connection with chronic cough showing definite clinical symptoms of tuberculosis, one must also rely on microscopic examination and in this case it is principally sputum. In this connection it is interesting to note the difficulty of getting tuberculous cows to cough and the large number of cows that have extensive lesions of tuberculosis in the lungs without any cough. As regards tuberculous emaciation very little need be said save that one must at times be cautious, as everyone has experienced the slaughter of a typical case of tuberculous emaciation and on *post-mortem* examination found no lesions of tuberculosis, or a slight lesion which had no relation to the emaciation. I am sure most of you here have also experienced chronic broncho-pneumonia, which is difficult or impossible to differentiate from tuberculosis in the living animal. The tuberculin test in most of these cases will not discriminate as the animal may have small lesions of tuberculosis confined to an organ or lymphatic gland.

With reference to the tuberculin test, we find it of great service in the carrying out of the Bovine Tuberculosis Order.

Before I conclude, I would like to give at any rate my opinion on the question of vaccination, and of course I refer to the Calmette-Guérin method of vaccination.

Vaccination will only limit the extent of the disease in an animal; that is, *if successful*, it will prevent the development of the disease and the lesions may be confined to certain organs; in other words, there will be a small death rate, but it will give no guarantee that the udder of a cow will remain free from lesions.

I do not want to discourage vaccination, but I do say that we have not sufficient grounds yet to advise it, but we should strongly urge experimental work in this direction.

At the International Veterinary Congress held in London last summer the Calmette-Guérin method of vaccination was one of the most important subjects up for discussion. My impression from that discussion is that the European countries mostly favoured vaccination, and America, that is the United States and Canada, was completely in favour of total eradication. The sum total of the discussion, most ably put forward by Watson of Canada, is that total eradication carried out in America has achieved results, and great results, but the Calmette-Guérin vaccination method, up to the present, has done nothing to lower the incidence of the disease.

I beg to move the following Resolution:—

> "That, due to the danger to the public and the loss to traders and agriculturists, it is advisable to take steps towards the complete eradication of bovine tuberculosis."

The Chairman then called upon Professor T. G. Browne of the Veterinary College, Dublin, to continue the discussion.

Professor T. G. Browne: I hope to deal with a different aspect of the question from Mr. Dolan. Before referring to this country I think it would be instructive to review the progress and procedure in other countries in connection with this problem. Speaking generally, the only countries which have made any appreciable progress in the eradication of this disease are those countries in which the incidence of the disease was comparatively low, namely, U.S.A., Canada, Norway, Finland and the Channel Islands.

In other countries where the percentage of infection approximates that in this country, the position regarding the eradication is practically the same as it is with us, no marked progress having been made.

The U.S.A. holds the lead in eradication work and the procedure which has been adopted there is continuously being held up to us as an example to be followed. The U.S.A. is a comparatively new country and she has learned a great deal from the mistakes of the older European countries, and this applies to the eradication of bovine tuberculosis. She has simply tackled the problem in time, having seen that the older countries allowed this matter to advance too far, almost beyond control.

The problem in U.S.A. was a comparatively simple one as compared with that in this country, simply because the incidence of bovine tuberculosis in that country was comparatively small when the eradication campaign started in 1917, being then only about four per cent. Furthermore, a very large proportion of the disease which existed was confined largely to certain areas and States, in particular those which were most densely populated, leaving large areas either free or almost free from the disease. The presence of these tubercle-free or nearly tubercle-free areas is really the secret of the progress which the U.S.A. has made in the eradication of the disease, because from these areas clean animals were drawn to replace immediately the condemned animals in the infected areas. In Ireland where, so far as we are aware, no tubercle-free areas exist, our difficulty would be not altogether the expense involved in clearing out the reacting animals, but the impossibility of replacing these animals by others which could be relied upon to be tubercle-free. Even if one buys animals in the open market subject to the tuberculin test a certain proportion of these animals will be in the incubative stage of the disease and will therefore introduce infection into the herd.

As an illustration of how simple a matter it was to clear some parts of the U.S.A. of the disease I cannot do better than describe the conditions which obtained in North Carolina, the first State in America to be declared "accredited." Incidentally, this State is about the size of Ireland. In this State at the commencement of the campaign the percentage of bovine tuberculosis was less than five per cent., or less than one animal in two hundred, and the total cost of eradication worked out at 50 cents, or about 2s. per head of the cattle population of the State. The State consists of 100 counties and in 12 of these there was not a single reactor and in four other countries only one reactor in each county was found. It is obviously a very simple matter to produce accredited herds and accredited areas under these conditions. On the other hand, some States were very heavily infected, chiefly the densely populated States as, for example, the State of New York which had over 30 per cent. reactors. This percentage in New York has now been reduced to about seven or eight, so that, here, good work has been done, but this was made possible only by immediately replacing the condemned animals by clean animals from the tubercle-free areas.

One sees it frequently stated that bovine tuberculosis in the U.S.A. has been reduced by 50 per cent. since the campaign started,, but when one analyses the figures this statement appears somewhat misleading. The position is this. At the end of last year (1929) approximately 41 per cent. of all the counties in the U.S.A., containing 45 per cent. of the total cattle population, were under the eradication scheme, some of these being "accredited" while the others were in the process. This means that 59 per cent. of the counties, containing 55 per cent. of the cattle of the U.S., have not yet been touched as regards eradication work. Last year (1929) 11,683,720 cattle were tested, with 1·8 reactors, but what of the 55 per cent. of the cattle which have not yet been tested? Even though we grant that a reduction of 50 per cent. has taken place it means only a reduction of from about four per cent. to about two per cent. This does not appear so very rapid progress for a campaign which has been in operation for 12 years. In spite of what we often read, it is evident that the U.S. has still a long way to go before she completely eradicates bovine tuberculosis. After a campaign of 12 years only about 30 per cent. of her counties are "modified accredited" and of the 48 States composing the U.S.A. only three have completely eradicated the disease, namely, North Carolina, Maine and Michigan. At the same time

it must be admitted that the U.S. has done more than any other country to eradicate bovine tuberculosis.

The details of the American system of eradication vary in the different States. However, the following are the main provisions, but with some modifications for each State.

When the campaign started in 1917 the accredited herd plan was adopted, but after a few years' experience it was found that a herd was too small a unit to protect from infection, especially when it was surrounded by neighbouring infected herds. Then in 1923 the accredited area plan was adopted; that is, the testing was confined to certain defined areas which were usually counties or townships, and each area was treated as a unit.

The system is largely voluntary, inasmuch as a large proportion of the owners in an area, usually at least 75 per cent., must apply voluntarily to the State authorities to have the scheme adopted in their area and they undertake voluntarily to carry out the provisions of the scheme. When the cattle of these owners have been tested, restrictions or quarantine can be placed on the premises of any of the remaining owners, who have not undertaken the scheme, by preventing these owners from removing either cattle or cattle products from their premises. In this way the minority are compelled to come in with the majority.

No cattle are allowed into these areas unless they come from an accredited herd or have passed the tuberculin test a short time previously.

All the cattle within the area are tested within as short a space of time as possible, frequently within a week, by a large force of veterinarians.

In all cases the animals are tested with tuberculin, usually by the intradermal test, and all reactors are branded and slaughtered at official slaughter-houses where a recognised system of meat inspection is in operation.

If no reactors are found in a herd at the first test it is declared "accredited" right off. A herd containing reacting animals is retested every three or four months until no reactors, or less than five per cent. of reactors, are found, when it is declared "modified accredited." It is then tested every six months and when the herd has passed three successive clean tests, six months apart, it is declared "accredited" and a certificate to that effect is issued by the Bureau of Animal Industry.

An accredited herd is tested annually by a recognised veterinarian at the owner's expense and once every three years by the authorities. If any reactors are found at the official test by the authorities the certificate is withdrawn for a further period. It has been found that usually only about two to three per cent. certificates have had to be withdrawn on this account.

Compensation for the reactor is paid after the infected premises have been disinfected to the satisfaction of the authorities. The work is carried out chiefly by the whole-time veterinarians employed some by the county, some by the State and some by the Federal Government, but sometimes local veterinarians are employed temporarily, by the State for the work.

An intensive publicity and educational campaign is carried on. Popular articles and maps showing the progress of the work are published in the newspapers. Public lectures, films and radio-talks are also utilised to impress the public with the economic and public health benefits of having tubercle-free stock.

This Scheme has gained the support and approval of the great majority of stock-owners and it has been found that animals from accredited areas realise on an average 25 dollars per head more in the open market than those from other parts.

In Canada a similar scheme is in operation and is making satisfactory progress. In cattle tested during the period 1920-1927 the average percentage of reactors was 10·8, but this percentage has now been reduced to about six. The incidence of bovine tuberculosis was therefore considerably higher in Canada than in the U.S.A.

Considerable opposition by the farmers was at first encountered in Canada. The farmers objected particularly to the branding of reacting animals, but owing to a publicity campaign a considerable demand for tubercle-free milk grew up, with the result that after a time voluntary applications to have herds accredited rapidly increased.

In most of the European countries the position regarding bovine tuberculosis is very similar to that which exists with ourselves. In Denmark, Holland, Belgium, Sweden and parts of France, Bang's system has been in operation for a large number of years, but very little progress appears to have been made.

In Professor Bang's own country, Denmark, his system has been in operation for over 30 years, yet the incidence of the disease is still high in that country.

Bang's system consists in dividing the herd into two sections, reacting and non-reacting. The non-reacting portion is kept isolated from all sources of infection and to this portion the calves from the whole herd are added, immediately after birth. This portion of the herd is tested frequently, and should any reactors be found they are immediately removed to the infected section of the herd. Bang claims that in this way a tubercle-free herd can be built up in from four to six years at very little cost, but experience has shown that perfect isolation requires great vigilance and perseverance and in the hands of ordinary stockowners often proves a failure.

More recently Bang has recommended that the clean portion of the herd should be built up from the calves only, without the introduction of non-reacting cows.

In Germany Ostertag's method has been in operation for many years, but here again very little progress appears to have been made. This method consists in getting rid of the clinically affected animals and is therefore somewhat similar to our Tuberculosis Order.

In Norway and Finland bovine tuberculosis has been almost eradicated. All reacting animals are branded and sent to the butcher. It would appear, however, that in these countries the incidence of the disease was never high, probably due to the fact that those countries are comparatively sparsely populated. In the Channel Islands bovine tuberculosis has been completely eradicated as the result of general testing and slaughter of the reacting animals. I have been unable to find figures indicating the incidence of the disease which existed in those Islands, but it was evidently low, for Captain Lainé, M.R.C.V.S., Veterinary Officer for Guernsey, states that 30 years ago Guernsey was free from bovine tuberculosis and that it was introduced into the Island at the first part of this century through animals being sent to England for Show purposes and returning infected. This illustrates how animals can become infected at Shows.

In Great Britain the Tuberculosis Order is in operation as it is here in Ireland, but it is very difficult to say if it is bringing about any reduction in the incidence of the disease. The Milk and Dairies Acts and Orders are also in operation and as a result there are some 201 herds supplying "Certified" milk and 273 herds supplying Grade "A" T.T. milk, but the question arises, how have these herds been built up? I am afraid that in most cases they have been formed by disposing of the reactors in the open market, so that the presence of these tubercle-free herds cannot be taken as an indication that any progress is being made in the eradication of the disease in Great Britain.

In Scotland, however, it would appear that a serious attempt will be made in the near future to introduce an Eradication Scheme similar to that in operation in the U.S.A. As you are doubtless aware, the West of Scotland Division of the N.V.M.A. recently drew up a scheme and circulated it to all the Divisions of the N.V.M.A. for their approval or otherwise.

As a result, the Scottish Branch of the N.V.M.A. took up the matter and circulated the proposed scheme, in a slightly amended form, to nearly every Public Body in Scotland, particularly Agricultural Bodies; also to the Scottish M.P.'s and the Public Press, with the result that that Scheme has now the backing of all the important Agricultural Bodies in Scotland. In August last year the Minister of Agriculture received a deputation in connection with the scheme, and this deputation consisted not only of representatives from the Scottish Branch of the

N.V.M.A. but also representatives from the Scottish Chamber of Agriculture, the National Farmers' Union of Scotland, and the Ayrshire Cattle Herd Book Society. It is recorded that the Minister expressed himself in sympathy with the proposals of the scheme and that he agreed with the necessity of a grant from the Treasury for the eradication of bovine tuberculosis, but he was emphatic that such a grant would not be made available unless some concrete scheme for a definite stated area showing probable costs was produced. In consequence, a suitable experimental area has now been selected in Ayshire and as soon as all the particulars of cost, etc., are available, a revised scheme will be submitted to the Minister.

The Scottish scheme is almost identical with the American scheme, but there is a proviso that in cases where reactors prove numerous and the owner finds himself unable to replace the condemned animals these must be branded and may then be retained under the Bang system. Should the necessary buildings not be available for the Bang system, in such cases it is recommended that temporary structures should be provided by the Ministry of Agriculture and Fisheries. The scheme makes another recommendation, and that is that the introduction of Irish cattle should only be allowed under the rigid conditions laid down for other cattle coming from outside the restricted areas. This last recommendation gives us some idea as to the problems the Irish cattle trade will be up against if eradication work is taken up seriously in Great Britain and no move is made by us in the same direction.

Without going into the details of this scheme I consider it sufficient to state that, owing to the high percentage of the disease, particularly in cows, I believe the scheme at the present time is not a feasible proposition. The scheme is years ahead of its time and it is doubtful if the public in Scotland is yet educated in this matter to the pitch required to make such a scheme a success.

As regards Ireland, I may say at the onset that a scheme on the lines of the American scheme aiming at immediate complete eradication is not a feasible proposition at present. The incidence of the disease is too high, the cost would be too great, and in the absence of any clean areas within the country it would be impossible to replace the condemned animals. Furthermore, such a scheme would not have the support of the farmers and public generally, because they are not yet educated in this matter up to that pitch which would render them capable of appreciating the economic and public health advantages of having the country stocked with tubercle-free cattle.

However, this country has certain advantages in connection with a campaign for the eradication of bovine tuberculosis. The chief advantages are that it is an island and it is almost an entirely exporting country as regards cattle, so that it would be a simple matter to prevent importation of the disease. Furthermore, there is some reason to believe that the incidence of this disease is lower in Ireland, particularly in the West, than in Great Britain. The time has come when we must make a move in this matter, because an eradication scheme is being seriously considered in Great Britain and if we are going to maintain our cattle trade with that country we cannot allow this country to lag behind. We cannot much longer maintain the idea that this matter is beyond control and sit tight and do nothing. Although complete eradication is out of the question for the time being, there are many steps that might be taken to reduce the incidence of the disease as a first step towards complete eradication.

1. The first step necessary is to secure the support and co-operation of the farmers and public generally, and this can be done only by an intensive educational campaign in the nature of lay-press articles, films, wireless talks and lectures pointing out the economic and public health advantages of having tubercle-free stock. If this were instilled into the public by the press, etc., in the same way, for example, as the alleged benefits to be gained from Beecham's pills or Phospherine or some other patent remedies, the public would soon become interested. This matter has never been put before the public in the right way and the public have never really had an opportunity of learning the facts of the case. As things are at present, the public are so ignorant of the whole matter that the great majority would not even patronise the dairy farmers who went to the trouble and expense of producing tubercle-free milk and much less would they be willing to pay a higher price for such milk.

We cannot legislate ahead of public opinion: legislation must follow public opinion. Any scheme, whatever it may be, must be taken up voluntarily on the part of the stock-owners. Compulsion in any form encourages antagonism and tends to breed a spirit of resentment in the minds of the owners.

2. Routine inspection of all cows whether they produce milk for public consumption or not, with the object of removing all clinical cases. This would simply be an extension of the present Tuberculosis Order.

3. Get rid of all old cows, say, over ten years of age. There is no doubt that a large proportion of the open cases of the disease are in old cows and by getting rid of these we would thereby perhaps eliminate the most important factor in the spread of the disease. This would not entail any great hardship on the owners; in fact, it would be a blessing in disguise, because in the great majority of cases the keeping of old cows is not an economic proposition.

4. The introduction of a milk-grading scheme—and here I would suggest that the designations used for the different grades of milk should not be misleading to the public, as they are in Great Britain, but should be simply A, B and C, so that the public would know exactly whether the milk was 1st, 2nd or 3rd Class.

5. Farmers who produce tubercle-free milk should be granted a subsidy as an inducement to others instead of having to pay a licence for the privilege of using the title "tubercle-free" or any other designation.

6. All milk from creameries should be pasteurised, because this is used for feeding calves and pigs and is an important source of the spread of the disease.

7. Reacting animals at Shows should not be allowed to come into contact with non-reacting animals.

8. The farmers should be encouraged to make their herds self-contained, as far as possible, by rearing their calves to replace the older stock and thus avoid introducing infected animals into their herds.

9. A factor that could be made use of in tracing cows giving tuberculous milk is the tracing of infected pigs, found by meat inspectors, to their respective owners. The great majority of pigs found to be tuberculous at slaughter-houses have been infected through tuberculous milk and this information should be utilised in tracing tuberculous cows for, even though no further steps were taken, it would be only fair to the owners of these pigs to inform them that the milk is dangerous. There are very few farmers who would knowingly feed such milk to their pigs or perhaps to their families; besides, it would impress on the owners the dangers which are connected with tuberculous milk, for the infection of pigs is an index of the danger to the human subject. These pigs could be identified and traced by a system of tattooing, as in America.

10. Having reduced the incidence of the disease to, say, four per cent. or five per cent., an attempt might then be made at complete eradication by introducing the American system of accredited areas. The first step in this direction is to get one tubercle-free area from which to replace the condemned animals in the infected parts. This area is likely to be the most easily obtainable in the West of Ireland, where the incidence of the disease is evidently comparatively low and the herds are largely self-contained.

Once a clean area was established the cattle therein would become more valuable, as was shown to be the case in America, with the result that a stimulus would be created for the formation of the new areas.

No recommendation can yet be made regarding the B.C.G. vaccine, for this agent is as yet only in the experimental stage.

At best the eradication process must be a very slow one. Even if all the reactors could be cleared out at one sweep, new crops of reactors would be arising for a number of years, due to animals being in the incubative period when tested and also due to animals becoming infected through

infection being left behind, such as infected grass, infected houses, infected drinking pools, infected manure used to dress fields, etc. For this and other reasons the estimation of the probable cost of total eradication is a very complex problem and on this account I shall not attempt to deal with this matter in the short time at my disposal.

There is no need for me to stress the advantages that would accrue from having the stock of the country tubercle-free. There would be less tuberculosis in the human and fewer sanatoria; there would be fewer pining cows; there would be very little condemned meat and last, but not least, it would be a great boon for our export trade. We should no longer hear those reflections from across the Channel to the effect that the disease is being imported from us into that country. We have all heard of the complaints from the Glasgow Corporation about the tuberculous meat and tuberculous cows coming from Ireland and quite recently some Scottish Bodies passed resolutions calling on the British Government to prohibit the importation from Ireland of all milch cows and springing cows unless they have been tested and certified free from tuberculosis. Again, the Chief Veterinary Inspector in one of the leading bacon factories in England states "a large percentage of the pigs killed at this factory come from the Irish Free State. The creamery districts of Cork and Waterford provide a high percentage of our tuberculous pigs." He further states that he notified the Health Authorities there, but he says "with no apparent effect, not even an acknowledgment."

Whatever steps may be taken we have got to approach our Government in the matter sooner or later, but before doing that we must gain the support and influence of all the leading Public Bodies in the country, particularly the agricultural bodies, as has been done in Scotland. It would be worse than useless for this Association to approach the Government on its own. We must have the support of other leading Public Bodies, and there is one Body which I know would be very anxious to join with us in this matter and that is the Irish Clean Milk Society. This Body in 1928 petitioned the Local Government Board praying for the introduction of legislation to ensure a safe milk supply in the Irish Free State. Just before I sit down, while on this point of gaining the influence of outside Bodies, might I make a suggestion, and that is that we should take a leaf out of the book of some of the Associations across the Channel by occasionally inviting to the meetings of this Association on special occasions, members of outside Bodies and other professions. To-night, for example, when this subject is being discussed we might have had with us, to our mutual advantage, some members of the Medical Profession and others interested in the production of a pure milk supply and a tubercle-free country.

Mr. P. J. Howard, in emphasising the advantages of enlisting public support, said it indicated the apathy and ignorance of the public in this matter when they considered the fact that it was only in recent years that any serious attempt had been made in England and Ireland to have clean milk, apart altogether from tubercle-free milk. If the educational authorities could be got to introduce this subject into the curriculum at schools and colleges, especially agricultural schools, a great deal would have been done in tackling the problem. Indeed, the carelessness of the public was further exemplified by the attitude of those in authority, who might be expected to guide public opinion on the matter, by their offering, in recent periods, the extravagant, noble salary of £10 or £15 per year to members of the profession for the inspection of cows and dairies in some very important towns in Ireland.

It was the late Mr. Gladstone who, when asked for the solution of some very difficult public problem, replied "*Educate*," and when asked again, replied, "*Further educate*" and when again asked, replied "*Still further educate.*"

It was only when the public were properly educated on the importance of this matter that there would be a public demand on the Government to tackle it.

Probably the first man in these countries to establish a tubercle-free herd was the late Lord Gough, of Lough Cutra Castle, when he was Ambassador in Germany. He consulted Sir John M'Fadyean, and as a result Mr. Howard was asked to test the herd. There were twenty-six cows in the herd and he (Mr. Howard) tested them and found only three reactors. For about ten years the herd was tested twice a year, and, in addition, each heifer was tested before being got in calf and then tested again before being allowed to join the herd of milch cows. Ten years after its establishment there was practically not a reactor in the herd. He had a similar experience with the Hon. Mrs. Vandeleur, when she established a Kerry herd. In order to ensure a sound basis, a fee of as much as £5 was sometimes given for the right to test animals before purchase. Nine animals were bought from the Knight of Kerry, not one of which was a reactor, and these, with various other carefully selected purchases, resulted in a herd of twenty-seven animals being secured within twelve months. The owner, being desirous of adding a few Jerseys, bought half-a-dozen, four of which were taken subject to test. The remaining two were taken without test and the result was that the following year these two animals were found to be affected and there were also two or three Kerries affected. They were put out of the way and for eight years, whilst the herd was maintained and regularly tested, there was practically not a reactor in it.

It would be foolish to say that there had been no results from the work done under the Tuberculosis Order or through the small attempts made by the inspection of cows and dairies in the various counties in which the Order had been put in force. On the contrary, there were good results and a big improvement over the conditions of ten years ago, and that the public were noting these results was well shown by the fact that whereas there was then only one inspector of meat, cows, and houses, etc., for the City of Dublin, to-day there was a big staff doing this work and other towns were following suit.

Tuberculosis was a disease of domestication, and that was well shown from Mr. Dolan's statistics. He was glad to hear Mr. Dolan testify to the freedom of the Kerry cow on the native hills of Kerry.

In connection with the establishment of tubercle-free herds, he would like to see the open-air system of cow-keeping more often recommended. The system was preferable to improper housing under unnatural conditions.

At the outset, all that it would probably be wise to attempt if a scheme of eradication was officially sanctioned, would be to confine it to owners who would be satisfied to go on with the work, and who could afford to do so, and that the State should simply supply the veterinary inspection and testing. There were owners in this country who were so circumstanced that they would be able to provide facilities for keeping animals that had been tested and passed and saving them from contamination, and such owners should be encouraged by the State providing proper veterinary help and also by the granting of small subsidies in cases where milk was supplied. Any general scheme of eradication would, however, he was afraid, be hopeless until the public was first educated on the matter and satisfied to pay a better price for milk guaranteed to be free from infection. He again stressed the suggestion that the educational authorities might be got to introduce the subject into their programmes at agricultural colleges and even at national schools, and if this were accomplished much ground would have been covered in the direction of obtaining a national scheme for the eradication of tuberculosis.

Mr. F. J. Daly said that, in view of the reference to the Scottish scheme, sight should not be lost of the fact that 75 per cent. of the cattle going to Scotland were Irish stores, and it was being suggested that these cattle should all be tested either at the port of export or at the port of landing. It was hard to see how the store cattle trade here could be carried on at all under those conditions.

In regard to the Canadian scheme, it was not hard to realise that if the Scottish buyers of stores could get Canadian cattle guaranteed free from tuberculosis, then, even if the quality was not exceedingly high, they would prefer to do that rather than run the risk of buying Irish cattle and having them tested and possibly rejected. That was a rather important point to make in urging that some

efforts should be made here to eradicate the disease. It was quite impossible to propose testing all the cattle in Ireland and scrapping the reactors. A beginning could be made with a small area where the expense would not be enormous, and in that respect the West of Ireland, where there were few importations of cattle, might be tried.

In regard to education, he suggested getting the different breeders' associations, cow-testing associations and so on, to have papers read at their meetings by veterinary surgeons interested in that type of work. Furthermore, every member of their Association, whenever opportunity occurred, should make a point of directing the attention of farmers, stockowners, etc., to the danger of using milk from cows that were not free from tuberculosis. Hospital authorities should also have this danger pointed out to them. The passing of a Milk Grading Bill would be a great incentive in the establishment of tubercle-free herds.

As to the formation of a scheme of eradication, the Scottish method seemed to be the most feasible, with certain modifications. If adopted here, it would have to be commenced on a very small scale, owing to the number of reactors generally.

Mr. H. O'Leary wished to thank Mr. Dolan and also Professor Browne for the splendid papers they had read in connection with the very serious question of bovine tuberculosis. He was sure that if the general public, especially mothers, could be got to realise the seriousness of this condition in cattle and the danger to their children, we would have gone a long way, as mothers would insist on getting milk from tuberculin-tested cattle.

The children would wonder why she so insisted, and in this way an educational campaign would be set up. He was also of opinion there should be some method of school education in this direction and the most important of all was through the medium of the press.

Doctors could also do a great deal if they only would suggest to mothers that their children should have T.T. milk, and he also thought that veterinary surgeons should make it their business to bring up the question when with their friends, and also have their own cattle free from this disease and advise others to do likewise, as the greater the number of tuberculosis-free herds the less the number of affected animals.

He had at present under his care one tubercle and abortion-free herd of 52 cattle. The former was started about three years ago, in this way; he was asked to test a nine-months-old bull for show purposes, which he did and got a definite reaction. At the same time, at his own request, he tested the dam, as the lymphatic glands of the head were enlarged, and again he got a reaction. He advised slaughter and invited the steward to the *post-mortem*. They found two cases of generalised tuberculosis. The steward was amazed and went home and told the owner what he had seen. The following morning the owner came to Mr. O'Leary's office and asked if he thought his cattle were affected. He said he thought 30 per cent. of his milch cows and 10 per cent. of heifers would react. "Well," the owner said, "what we don't know, won't trouble us," but it did trouble him, because inside a week Mr. O'Leary had tested the complete herd with the following results: out of 24 milch cows, 10 reacted and one of those was the best in quality and quantity in the county; at the same time he tested 32 heifers and calves and got three heifers reactors. All were immediately destroyed but the owner was now happy, as last week Mr. O'Leary tested 56 of his stock with not a single reactor. He added that this was a self-contained herd and practically isolated from the mainland.

The other herd, with Mr. Dolan's help, he persuaded the owner to have tested and so set up a tubercle-free herd, but he must say he got very unsatisfactory results there, as fresh cattle were bought in the open market and he found it very hard to keep the herd free. However, this owner was doing all he could do under the circumstances and his fellows should be encouraged and helped as far as possible. He just gave them examples of what a veterinary surgeon could do if he would only try.

There was also another matter which he was anxious to mention, if it was not going away from the point—and he thought not—and that was the methods of testing animals used by some veterinary surgeons. He knew of cattle that were tested by the subcutaneous method and the temperatures taken only at the time of injection, and twice afterwards—the 12th and the 18th hour—and the fee charged for such testing was very small. This practice could not be sufficiently condemned, as it had a two-fold effect: firstly, the cattle were not properly tested and some reactors and doubtful ones were missed; secondly, it left a bad impression on the owner, and public in general, and it was not fair to those people who carried out the test in a proper way and those who paid for the same.

In his experience of Kerry milch cows he found the percentage of reactors to be somewhere in the neighbourhood of 10 per cent., but the percentage, he believed, varied in different parts of the country and some said the percentage was as high as 40 per cent. in parts of Limerick.

He believed the widening of the scope of the Tuberculosis Order should be the first step taken in the eradication of tuberculosis from this country, coupled with education of the public.

Messrs. Hynes, Lambert, Daly, O'Donovan, McClancy and Murphy having addressed the meeting, the Chairman said they could congratulate themselves on a very interesting discussion. There were a few points which, perhaps, called for comment. The statistics regarding the incidence of the disease were very imperfect, and thanks were due to the good work done in that direction by the inspectors of the Dublin Corporation. It would be of the greatest value if statistics of the tuberculin tests which were, presumably, being carried out—if not systematically, at least spasmodically—could be brought together in order to ascertain the average incidence of the disease in various parts of the country. In formulating any scheme for eradication they must have more information. The farmer was often blamed for having tuberculosis, but it must be realised that it was not his fault, it was his misfortune, and he must be stimulated to clear his herds of the disease by the prospect of better returns. Compulsory schemes had been tried and failed, and it was only those which were receiving the support of the farmers that were really progressing.

Whilst ambitious schemes were not for the moment, there was no doubt that something could be done and could be recommended. At least one step could be taken now, and that was the introduction of a Milk Bill to provide a scheme for the grading of milk at the earliest possible date. (Applause.) That would be the first step and it was one which he thought the meeting could recommend. Other schemes might follow, *e.g.*, the "accredited herds"; but they wanted further information before they could recommend the adoption of the restricted area system as conducted in America. After all, in the latter country and in Canada the initial steps were connected with the grading of milk and in the case of America the grading was introduced as far back as 1891.

Professor Browne's suggestion as to the sterilisation of separated milk supplied by creameries was also one which deserved every commendation, whilst a third suggestion was the extension of the Tuberculosis Order. As it was conceded that the Order, as at present operated, would not reduce the incidence of the disease, the widening of its scope was called for so as to embrace cases of open, or clinical, tuberculosis which could be recognised and dealt with in the early stages. He did not think it was

possible to ensure a routine inspection of all cattle, but it was practicable to ensure frequent and regular routine inspection of dairy cows.

These were three plans which could be recommended if suggestions were to be put forward to the Government and which might ultimately end in wider plans for the eradication of tuberculosis in the various areas. (Applause.)

Removal of old cows from herds did not seem to him to be practicable—at any rate, in a compulsory way—and he did not consider that the question of the improvement of housing had quite the importance that Mr. Howard attached to it.

Before putting Mr. Dolan's resolution forward for adoption he thought it well to suggest that they should indicate what steps should be taken by the Government, and with this object they should have some sort of scheme that could be circulated amongst agriculturists. He suggested that the Council be asked to formulate proposals before the next quarterly meeting and these could then be reviewed and put forward to the authorities.

Mr. Howard proposed, as an alternative, the adoption of Professor Browne's suggestion as to the sterilisation of all milk from creameries as a first step towards eradication.

Mr. Rogan seconded. This amendment was withdrawn.

Mr. McCorry proposed, as an amendment, "That the whole matter be referred to Council for consideration and report."

The amendment was carried.

Owing to the late hour to which the discussion had been prolonged, no further business was transacted and the meeting then concluded.

J. J. O'Connor, *Hon. Secretary.*

Army Veterinary Service.

Movements of Officers.

Major W. B. Howe arrived home from Egypt on January 1st, and has been posted to the London District for duty.

Major J. Smith is at present on leave in this country from India until March 2nd; on that date he will revert to the British establishment and be posted to the Northern Command for duty.

Major P. F. Woodland arrived home from India on January 1st, and is now doing duty in the Northern Command.

Majors R. H. Stalker, C. Holland, M.C., and W. E. Barry arrived home from India on January 7th, and have been posted to the Eastern Command for duty.

Majors B. A. Jarvis, and C. W. Heane sailed for India on January 10th, for a full tour of duty abroad.

Major C. J. R. Lawrence, O.B.E., proceeded from Brighton to the Royal Military College, Camberley, for duty, on January 16th.

Major F. C. O'Rorke, C.M.G., F.R.C.V.S., has been posted from the Royal Military College, Camberley, to York, for temporary duty as officiating Assistant Director of Veterinary Services, Northern Command, during the absence on leave of Lieut.-Colonel G. P. Knott, O.B.E. He proceeded to York on January 19th.

Major A. Hodgins, D.S.O., has been admitted to hospital at York, for an operation.

Major M. A. Murphy is at present on leave in this country from the Sudan until January 30th; on that date he reverts to the British establishment, and is being posted to the Southern Command for duty.

Captain A. P. MacDonald is at present on leave in this country from the Sudan until February 4th; on that date he reverts to the British establishment, and is being posted to the Aldershot Command for duty.

A Pig-Tale for Mandarins.*

By A. L. Hetherington.

An episode connected with the Falkland Islands battle between Admiral Sir Doveton Sturdee's cruiser squadron and Admiral von Spee's squadron after its victory at Coronel has not been recorded in public print, but its humorous features are too precious to remain in oblivion in forgotten files.

It will be recalled that during the engagement von Spee ordered his light cruisers to try to escape by virtue of their speed. In this attempt only one was successful, the *Dresden*, and it was some considerable time before the *Glasgow* and *Kent* were able to run her down and sink her on March 14th, 1915, at Juan Fernardez. When finally demolished, a number of prisoners were made, and among them was a pig, captured by a petty officer of the *Glasgow*. Apparently the pig had been a pet in the *Dresden*, and the petty officer sought and obtained the consent of his captain to keep the pig on board as a prize of war. The pig found its new surroundings entirely congenial, and rapidly installed itself as the pet of the *Glasgow*, on board which it remained until the end of the commission.

Some little time after the pig's transfer the petty officer was drafted to another ship, but the pig remained in the *Glasgow* as her mascot. About eighteen months after the Juan Fernandez engagement the *Glasgow* proceeded to Portsmouth to pay off, and here the story begins.

The captain of the *Glasgow* was in a quandary, for he did not know how to deal with the pig; he was aware, generally, of regulations relating to the importation of livestock, and realised that instructions were necessary unless he ordered the pig's destruction. Such a course would have led to considerable feeling on board, since the pig was a universal favourite. So he signalled to the Commander-in-Chief, Portsmouth, explaining that he had on board a pig, captured from the cruiser *Dresden* at Juan Fernandez on March 14th, 1915—some eighteen month previously. The pig had not been in contact with any other swine throughout the whole period, so would it be in order to land the pig? The Commander-in-Chief signalled in reply that the question was not one he could answer without reference to the Admiralty, and in all probability it would have to be referred also to the Ministry of Agriculture and Fisheries. Pending the necessary inquiries, the captain of the *Glasgow* should retain the pig on board in isolation from other livestock.

The Commander-in-Chief wrote to the Admiralty accordingly, setting out the facts as reported and asking for instructions. The Admiralty, as surmised, replied to the effect that the question at issue was one for the determination of the Ministry of Agriculture and Fisheries, but the necessary inquiry was being made, on the receipt of which a further communication would be sent to Portsmouth.

The Ministry of Agriculture then wrote at some length, explaining for the information of the Lords Commissioners of the Admiralty that the importation of swine from foreign parts was strictly governed by the Diseases of Animals Act, 1896 (59 & 60 Vict. c. 15). In accordance with that statute swine from foreign parts could only be landed in the United Kingdom on certain areas prescribed in the schedule to the aforesaid Act, and unfortunately Portsmouth was not a "prescribed area." In the somewhat special circumstances of the case, however, the Ministry was prepared for the purpose of this pig, and this pig only, to prescribe an area on the Portsmouth jetty for the temporary accommodation of the pig in question, where it could pass the necessary quarantine period. They regretted that the undisputed fact that the pig had not been in contact with any other swine for the last eighteen months did not render nugatory the provisions of the Act quoted. To put the matter in order the Ministry would send two inspectors

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to Portsmouth, one an expert in quarantine arrangements and the other competent to map a proper area.

The two inspectors duly arrived and mapped a spot on the north-west corner of the jetty, showing the area to be prescribed for this pig, and this pig only. The map was then transmitted by the Ministry to the Admiralty and then forwarded by the Lords Commissioners to the Commander-in-Chief, Portsmouth, for the issue of the necessary instructions. On receipt of the instructions the captain of the *Glasgow* arranged for the disembarkation of the pig on the area prescribed, and for its suitable protection and isolation by means of barbed wire and similar precautions against contamination with other livestock. The captain of the *Glasgow* was much relieved, since the presence of the pig on board was delaying matters; and amid affectionate farewells the pig was duly installed on the area prescribed.

But the general business of paying-off by this time was completed, and the proper feeding of the pig and its protection from contamination with other livestock gave rise to increasing difficulties. The captain of the *Glasgow* was greatly worried until he met the captain of Whale Island, who told him that he had recently started a piggery on Whale Island, and would willingly add the pig from the *Glasgow* to it. A signal was again made to the Commander-in-Chief, Portsmouth, pointing out the difficulties of looking after the pig on the area prescribed for it on the jetty, in view of other pressing business and shortage of staff—difficulties which were likely to increase before the quarantine period was over. The signal went on to report the provisional arrangement made with the captain of Whale Island if the transfer to Whale Island was authorised. The signal in reply indicated that, as the present arrangement had been made between the Admiralty and the Ministry of Agriculture, it would be necessary that any deviation from it should be sanctioned by the same authorities—inquiry would be made.

In due course the Admiralty made the necessary reference to the Ministry of Agriculture, who pointed out, for the information of the Lords Commissioners of the Admiralty, that the pig had not yet completed its quarantine, and consequently no transfer to another portion of the United Kingdom, *e.g.*, from the Portsmouth jetty to Whale Island—could take place prior to the completion of the quarantine unless an area on Whale Island were also scheduled in accordance with the Diseases of Animals Act, 1896, for the purpose of this pig, and this pig only. Especially did this course appear to be necessary, since, as the Ministry understood to be the case, it was proposed to allow the pig in question to be associated with pigs already domiciled in this country. The Ministry of Agriculture added that, in view of all the circumstances, they would be prepared to schedule a suitable area in Whale Island, and two inspectors, as before, would proceed forthwith to undertake the task. The two inspectors duly arrived, armed with knowledge and mapping instruments, and drew up a plan of a place on Whale Island suitable, in their view, for the completion of the quarantine of this pig, and this pig only. The map was transmitted to the Admiralty, and thence to the Commander-in-Chief, Portsmouth, and so to the captain of the *Glasgow*, accompanied by strict injunctions that the transfer must be carried out without any risk of contact with other livestock, especially swine. The captain of the *Glasgow* now began to see an end to his troubles, and signalled Whale Island suggesting that a cutter should be sent to convey the pig from the prescribed area on the jetty to the prescribed area on the Island. An old harbour-service cutter was accordingly requisitioned, thoroughly disinfected, and towed by a steam-launch to the jetty. On arrival there the pig was carefully lowered into the cutter and a net placed over it, and amid hilarious farewells the pig started off, the sole occupant of the cutter. Unfortunately, before Whale Island was reached the painter of the ancient cutter parted, and, what was worse at that moment a heavy sea fog blew up, so that the pig was drifting about all alone in the fog. Here was a to-do! Search parties were organised, since on no account could the pig be allowed to land on any unprescribed area without incurring the wrath of the Legislature, and possibly bringing under critical review the magnanimous attitude displayed by the Ministry of Agriculture in the importation of this pig, and this pig only. Eventually, aided no doubt by the squeals of the pig, they located it in the fog and the cutter was again taken in tow by the launch, this time with a more efficient painter. A course was set for the prescribed area on Whale Island, and in a few minutes the pig was landed at the correct spot and duly fenced in, according to the directions of the Ministry's inspector.

Here the story might seem to end, but not so. A short while afterwards the petty officer arrived home and inquired after his pig. He pointed out that he had been allowed to keep the pig as a prize of war, and he wanted his pig. The petty officer was told that his pig was now on Whale Island completely incorporated with the authorised swine of the United Kingdom, and any representations must be made to the captain of Whale Island. Nothing daunted, the petty officer presented himself to the captain of Whale Island and stated his case. The case was convincing, and the pig was handed over, free to be transported to any part of the United Kingdom. Eventually the petty officer carried it off to his home in Yorkshire, where shortly afterwards a Red Cross sale was held. The petty officer, under orders to rejoin the Fleet for further war service, and full of enthusiasm for the Red Cross organisation, arranged a raffle for the pig. Tickets to the value of no less than 200*l.* were taken for the pig with its distinguished record on sea and land, and the holder of the winning ticket added further to the Red Cross funds by putting the pig up to auction, when it was finally disposed of for another 200*l.*

Notes and News.

Diary of Events.

Jan. 26th.—Meeting of the Editorial Committee, N.V.M.A., at 2 Verulam Buildings, Gray's Inn, 4.30 p.m.

Jan. 28th.—Annual Meeting of the Scottish Metropolitan Division, N.V.M.A., at Edinburgh.

Jan. 30th.—R.C.V.S., Council Election. Issue of Foreign Voting Papers.

Jan. 30th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds.

Jan. 30th.—Annual Meeting of the Royal Counties Division, N.V.M.A., at Reading.

Feb. 5th.—Meeting of the Central Division, N.V.M.A., at 10 Red Lion Square, W.C.1.

R.C.V.S. Obituary.

McKie, John Henry Shiel, Offord House, Spilsby, Lincs. Graduated Glasgow, July 18th, 1924. Died January 9th, 1931.

Death of Major H. Kirby, D.S.O.

It is with deep regret that we have to announce the death of Major H. Kirby, D.S.O., which took place at Naini Tal, India, on January 6th, 1931, from pneumonia, at the age of 52 years.

The deceased officer graduated in Edinburgh on May 21st, 1902, was gazetted to the Royal Army Veterinary Corps in the rank of Lieutenant on May 11th, 1904, promoted Captain May 11th, 1909, Major on July 10th, 1915.

Major Kirby served in France, Belgium, and Mesopotamia during the Great War, was twice mentioned in Despatches, and awarded the D.S.O., the 1914 Star and Clasp, British War Medal, and Victory Medal. He also served in South Africa as a Civilian Veterinary Surgeon.

During his service, Major Kirby held several administrative appointments, the chief of which were Officer Commanding, Advanced Base Veterinary Hospital, Baghdad; Officiating A.D.V.S. Eastern Command, India; and Deputy Assistant Director of Veterinary Services, 17th Division, Mediterranean Expeditionary Force. He held the rank of temporary Lieut.-Colonel for over twelve months, whilst commanding the Veterinary Hospital.

Major Kirby leaves a widow and two sons, to whom all officers of the Corps tender their deepest sympathy in their sad loss.

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Mr. George E. Haines.

We deeply regret to announce the death on January 10th, at his residence, 8, York Road, Rathmines, Dublin, of Mr. George Ernest Haines, who occupied the position of Registrar of the Royal Veterinary College of Ireland since the year 1911. Mr. Haines was educated at Benson's School, Rathmines, and was for some time Assistant Librarian at Trinity College, Dublin. His death will be felt as a personal loss by the very large number of his veterinary friends.

Principal J. F. Craig writes: "The announcement of Mr. Haines' death will be an item of regretful interest to many of your readers who have come in contact with him during his term of office. Of a genial and kindly disposition, he was a popular as well as an efficient member of the staff and endeared himself to all who knew him and especially to his colleagues and the students.

"He had been in failing health for some time and the end was not unexpected."

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Sir Charles Cust.

The sympathy of her fellow members of the profession will be extended to Miss Isabel Cust in the death of her distinguished brother, Captain Sir Charles Leopold Cust, Bt., Equerry to the King, who died in a nursing home on Monday last. Sir Charles, who has been happily and aptly described as the King's greatest friend, came of a family distinguished in the service of the Crown. His grandfather, the Hon. Sir Edward Cust, youngest son of the first Lord Brownlow, was a veteran of the Peninsula, who, having filled the office of Master of the Ceremonies to Queen Victoria, was created a baronet in 1876. His wife was Woman of the Bedchamber to the Duchess of Kent. Sir Charles's father, Sir Leopold, a godson of the King of the Belgians, was Gentleman Usher to Queen Victoria, and Sir Charles's mother, a daughter of Vice-Admiral the Hon. Charles Orlando Bridgeman, was Woman of the Bedchamber to Queen Victoria from 1885 to 1901. Sir Charles's youngest brother, Percy, who died at the age of 14, was a page of honour to Queen Victoria. The late Sir Lionel Cust, Surveyor of the King's Pictures, was a second cousin of Sir Charles.

Sir Charles Cust was unmarried and the baronetcy becomes extinct.

Personal.

The engagement is announced between Arthur Reginald, eldest son of Ven. A. F. Alston, Archdeacon of Hastings, and of Mrs. Alston, of Woodborough, St. Leonard's-on-Sea, and Elspeth, younger daughter of the late Sir Stewart Stockman and of Lady Stockman, of 7, Norfolk Mansions, S.W.11, and granddaughter of Sir John McFadyean, of Highlands House, Leatherhead.

Foot-and-Mouth Disease in Sussex.

The Ministry of Agriculture announced on Monday that foot-and-mouth disease has been discovered at Westmeston, Sussex, and that the movement of cattle, sheep, swine, and goats within a 15-miles radius of the outbreak has been prohibited.

The Editor acknowledges the receipt of the following:—
Communications from Mr. D. J. Anthony (Brierley Hill), Professor S. H. Gaiger (Liverpool), Mr. H. Gray (London) and Mr. W. J. Young (Newcastle-upon-Tyne).

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

Hydrocyanic Acid in Euthanasia.

To the Editor of The Veterinary Record.

Sir,—The note by W. P. Blount in the *Veterinary Record* of January 17th, in which he refers to the trouble in destroying animals sometimes attributed to old stocks of hydrocyanic acid, is interesting. On the relatively few occasions on which it has been my duty to destroy small animals, I have found the following method extremely efficient as compared to others I have tried.

I dissolve in 5 c.c. of water a small quantity of solid sodium or potassium cyanide. I use enough solid to cover the last quarter of an inch of a penknife. Similarly, *in another* receptacle, I dissolve some oxalic acid. Then I draw up the cyanide and immediately afterwards the acid into one syringe. These are promptly injected into the thoracic cavity.

By this procedure one is always certain of using extremely fresh active H.C.N., which is liberated in the chemical reaction between salt and acid. At the same time, one does away with the risk (admittedly small, but known to have occurred) in which the operator obtains an unwholesome smell of the poison or may splash some of the fluid into the eye or other mucous membrane.

The acid used could be varied, depending on the practitioner's choice and supply.

Yours truly,
Harvey S. Purchase.

The Molteno Institute for Research in Parasitology,
University of Cambridge.
January 19th, 1931.

Mr Elphick's "Query."

To the Editor of the Veterinary Record.

Sir,—Presumably Mr. Elphick's question in last week's *Veterinary Record* was written to initiate a discussion for the benefit of members of the N.V.M.A.

I should like to inform him that in the City of Sheffield notification of scheduled diseases by practitioners is arranged in the following manner:—

The local authority veterinary officers carry out the diagnosis of all specimens, free of charge, which the veterinary practitioners in their area care to submit to them. If a veterinary practitioner is called in by a client to see any of the conditions mentioned by Mr. Elphick, there is no reason why he should not attend and even take samples or carry out tests if he does not suspect any of the scheduled diseases until such time as the test applied proves such to be present. With a mutual understanding between the practitioners and the whole-time veterinary staff of the City, specimens or samples can be handed to the latter for a laboratory diagnosis, giving the name and address of the owner and full particulars. The diagnosis is communicated to the practitioner. If it is positive, the case is taken as notified and the practitioner has carried out his legal duty to himself and to the owner of the animal; if it is doubtful, the local authority veterinary officer may desire, by arrangement, to visit as a consultant with the practitioner and so carry out his duty in the area; if negative, the practitioner still retains the patient for treatment. The owner's obligation to report suspected disease to the local authority is often made through the veterinary practitioner in this way, which is quite satisfactory.

Yours faithfully,
William Tweed.

Town Hall,
Sheffield.
January 20th, 1931.